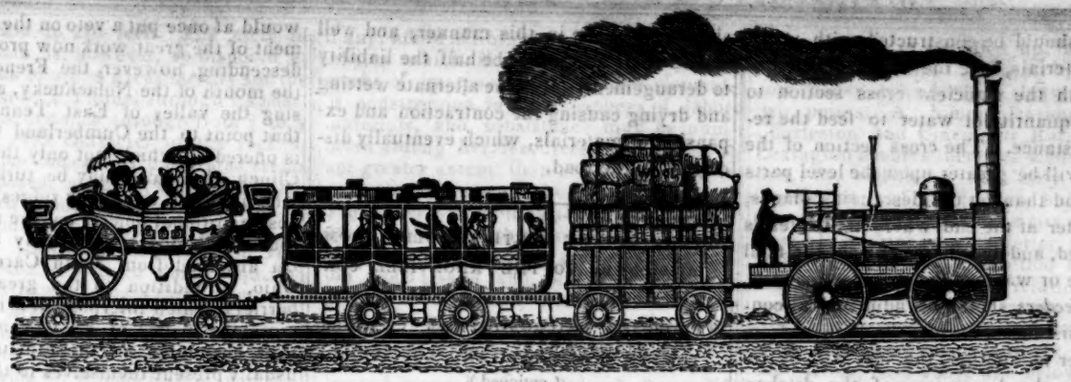

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, SEPTEMBER 3, 1836.

MINERAL WEALTH OF OUR COUNTRY.

Every day brings to light some new fossil treasure. We have seen some beautiful specimens of the Rossie lead found in St. Lawrence Co. This bed of ore has already been traced to a great distance from the spot where it was first met, and we have understood that it re-appears on the other side of the St. Lawrence, where copper is also found combined with small quantities of gold.

Two fine iron ore deposites have recently been discovered. The one is the "Winslow deposite," Sus. Co., N. J., being about thirty miles from this city. This one is very easy of reduction, while the yield is very considerable.

The other is at Troy, Vermont, owned by the Boston and Troy Iron Company. This ore yields about eighty per cent of superior iron.

Those who are curious can see specimens of these ores at our office—where we are always happy to receive specimens. We conceive the Iron of our country to be worth more than gold to us. All hail to the *Iron Age*.

STEAMBOAT NOVELTY.

When some time since we saw several articles going the rounds in the papers, denying the claim of Dr. Nott to the successful introduction of Anthracite coal as fuel in our large steamboats, we passed them without notice, not choosing to detail the improvements of Dr. Nott for the benefit of every scribbler who might feel inclined to criticise.

A more serious charge has been circulated, not indeed in print as we know, but at and about the landings on the river, and wherever else such gossip might prove entertaining to its authors and injurious to the Steamboat. We have heard of worthy citizens who were induced to believe that a trip in the Novelty was at the peril of their lives!

For the benefit of those unacquainted with the boat or her machinery, we must unhesitatingly state, that in our opinion, and we judge from observation—that the construction of the machinery of the Novelty is such, that any accident from the rupture of a boiler is altogether avoided—such rupture not being at all likely to take place, and if it does, it can not do the slightest harm to any one, as they are *tubular*.

Boilers of a construction somewhat resembling these, have burst in situations (on board) where care was not taken, (we believe in Mr. Hancock's steam carriage for common roads) and the engineer himself was not aware of the peril!! The steam and water escaped through a small opening, (no large one can be made) and extinguished the fire—giving by the stoppage of the machine, the first indication of the accident.

On this very account we should prefer this construction as being the safest, even in careless hands, much more do we prefer it when applied in so beautiful a boat and conducted by such experienced and able men.

We may here remark that the prevalence of the report, coming under our notice, we deemed it proper to give our opinion on this subject, formed upon frequent examinations of the boilers and machinery, or rather to state the truth—as we shall always be ready to do, without invitation from any one, the writer of this article never having seen Dr. Nott, except in his good works.

The best mode however, of becoming satisfied of the safety and comfort of the improvements of Dr. Nott, as applied to useful purposes in the Novelty, is to go one or two trips to Albany on board of her.

For the American Railroad Journal.

A PLAN WHEREBY A WOODEN RAILWAY SHALL BE RENDERED AS INDESTRUCTIBLE AS THE BEST IRON RAILROAD.

This plan consists in having the excavations and embankments, made sufficiently wide to admit a side ditch, or ditches, and *extra* embankments raised upon the outer edges of the road to an elevation of 15 or 18 inches above the plane of the roadway.—These *extra* embankments should be made about one foot wide on the top, with slopes of one and a half of base to one of perpendicular rise.

The *side ditch* or *ditches* with the *extra embankments*, and the *upper surface of the*

roadway should be constructed with water tight materials, and the ditch or ditches made with the sufficient cross section to admit a quantity of water to feed the required distance. The cross section of the ditches will be greater upon the level parts of the road than on the descending planes, and greater at the end where the water is introduced, and decreasing toward the final discharge or waste of the water.

The *feeders* should be admitted at convenient distances, the less the distance from one feeder to another, the less will be required for the dimensions of the ditches. *Waste weirs* should be built at proper points, so as to discharge all surplus water, and the feeding gates should be regulated to give a certain quantity of water and no more, as near as the circumstances will admit.

After the wooden sleepers and rails are laid, with the iron plate put on, and the road completed for use, the water should be introduced and maintained to an elevation that will completely cover the rails, leaving the track about one inch under water.—This will be a sufficient depth, and need not be exceeded for the purposes here required to accomplish.

It is well known that wood *immersed completely under water* is thereby prevented from decay, hence a wooden railroad in the situation here described would last as long as the best constructed iron road.

The difference in cost of course would be different, as the circumstance and character of the ground would change, but I have no doubt but the average cost of railroad, upon this plan, would be $5000 per mile less than the double track iron road.

There is hardly any situation where rail roads of any extent are made, but streams of water sufficient for the purposes required can easily be obtained. In the *winter season* the water should be drawn off or reduced at least two inches below the top of the rail. There is but little tendency to decomposition during the frosty weather, hence but little objection can be urged against this measure.

The slight obstruction the water would be to the rapid progress of the engine and cars would be nearly balanced by having a constant clean and uniform surface for the wheels to run upon, the friction would be more equal, consequently the moving power could be better regulated.

A thin light wooden box should be made to enclose the wheels from near their bearing surface over the top, in order to prevent the centrifugal force of the wheels in motion from throwing the water over the bodies of the engine cars, &c.

Many advantages might be enumerated in favor of this plan of making railroads. One is the uniformity which would be given to the temperature of iron plate, thereby correcting in a manner one of the great evils, the contraction and expansion of the iron plate. I believe, also, where a road should be made in this manner, and well settled there would not be half the liability to derangement. It is the alternate wetting and drying causing the contraction and expansion of materials, which eventually disorganizes the road.

REPORT OF THE SOUTH CAROLINA COMMISSIONERS TO THE KNOXVILLE CONVENTION, ON THE SUBJECT OF THE PROPOSED RAILROAD FROM CHARLESTON TO CINCINNATI AND LOUISVILLE.

(Continued.)

COL. GADSDEN'S REPORT.

From any of the gaps or depressions, by which an ascent from the east can be had to the summit of the Blue ridge, a descent *west* from some of the tributaries of the French Broad, may be obtained to the valley of the river, and along the banks of that stream, for the whole distance of about 140 miles to Knoxville, a plane approximating to great uniformity, and on inclinations varying from 20 to 30 feet to the mile, (all within the advantageous power of Locomotives,) may with great facility be graded. The river, forcing its way, as it does, through an extremely mountainous and rocky region, is often turned from its course, but I do not think that any of its curved deviations from a straight line form less arcs of circles than those on which Locomotives may move with safety and advantage—should, however, the instruments expose defects in this instance, which the eye has not been able to detect, the additional expense, only, of bridges on a river, crossed with great facility, will be necessary at all these points where curvatures adapted to the action of an Engine, cannot be obtained. My personal inspection of the valley of the French Broad extended but 95 miles to the mouth of the Nolachucky, at which point I crossed, and left that river, with a view of ascertaining from examination, the shortest practicable route for a road to the Cumberland Gap. This gorge in that mountain necessarily attracted my attention, as most frequented in all communications with Kentucky, and as one represented as being most depressed, and presenting the least difficulty in the passage over it. Descending the French Broad by the Warm Springs, the most direct route to the Cumberland Gap, would be from that point via Warrensburg, Cheek's ⋈ Roads, Bean's Station and Tazewell, in East Tennessee, a distance of 78 miles—on this line, however, the Paint Rock and the Paint Mountain, more formidable in its ascents and descents, than the Blue ridge itself, have to be surmounted; and the Clinch ridge, at Bean's Station, rising on a slope of ¼ of a mile, 800 feet from the east, and descending by successive slopes of 3 miles from the same elevation, to the valley of Indian Creek on the west. From thence a succession of hills and ridges by the town of Tazewell are encountered to the very foot of the Cumberland Gap, the approach to which by this route, is more formidable than the passage over that mountain itself, viz: Walden's ridge of 150 feet elevation at its lowest depression—hills on both sides the Powell River, the one of 250 and the other of 400 feet elevation, and the poor valley ridge of 150 feet in height. The obstacles in this direction, are so imposing, that if it was the only route by which a Railroad could be passed to the west, they would at once put a veto on the accomplishment of the great work now projected. By descending, however, the French Broad to the mouth of the Nolachucky, and by crossing the valley of East Tennessee, from that point to the Cumberland Gap, a pass is offered by which not only the Paint and Clinch Mountains may be turned, but by which most of the minor ridges, which, oppose additional objects on the more direct route by Bean's Station, may be avoided. On any road from South Carolina to the Ohio, in addition to the great mountain barriers, which interpose, it is necessary to cross the valley of East Tennessee, and thus encounter all the difficulties which usually present themselves to the construction of works, which pass at right angles to the water courses and their ridges. In this case, however, the valley is narrow, not exceeding 65 miles, and the spaces between the three rivers passed, the Holston, the Clinch, and the Powell, are so narrowed as to reduce considerably the slopes of the dividing ridges, and afford facilities by their innumerable tributaries, which necessarily interlock on these common fountains of their springs, by which these elevations may, with comparative ease, be ascended and descended. With these views of possible obstacles to be encountered, I gave to this portion a more careful examination than it was in my power to bestow on other parts of the extended route, which from the general conformation of the country, could not present other than the ordinary obstacles to the execution of the road contemplated. That these supposed difficulties may be the better estimated, I have deemed it advisable to give in detail a description of this part of a route across the valley of East Tennessee examined by me; not as reccommending it as the *one* to be selected, but as *one* which being found *practicable*, it may encourage the belief, that on a more careful examination of the whole country, some *others* presenting probably fewer obstacles, and more strongly recommended by their direction may be found.—Indeed from the limited time allowed, my observations could only extend to the ascertaining of the general fact, *of the practicability of a Railroad through its middle section* from Charleston to the Ohio, and not as to the *route*, which under the due estimation of comparative advantages (should *many* be found) it would be the most judicious to adopt. The result of my observations are not without their value in strengthening a confidence *in the practicability of the project*, and under opposing difficulties far less than was generally estimated.

Cumberland Gap is, at the point examined, exceedingly depressed the whole distance across from the Eastern to the Western base, being but one mile and three quarters, rising on the Eastern face, in the distance of 1000 yards, 300 feet—and descending from that elevation west, in the space of 2000 yards. The highest point on both planes presents two singular peaks, with a descent of from 30 to 40 feet between them; both of which may with great facility be levelled, filling up the hollows between, and forming a space or bench on the top of the Gap in the mountain, for the location of a stationary engine, which may be made to operate on both planes. The slopes of the Cumberland mountain are so favorable as you approach this Gap, that I have little doubt that a judicious graduation of both inclined planes could be effected, so as to reduce their lengths to 8 or 900 yards each, and their perpendicular

lift from 250 to 270 feet. The cleft in the mountain is, however, so disposed at this point as to afford great facility for the construction o. a Tunnel through its base, reducing the distance through from $\frac{5}{8}$ to $\frac{3}{4}$ of a mile. The character of the rock of which this portion of the Cumberland seems to be composed, being an indurated ferruginous sand stone, and very difficult to blast, would be the principal obstacle to the work. Such, however, is the very great objection to inclined planes requiring a stationary power to pass them; not only as to their first cost, which is very considerable, but to the continued annual expense, necessary to preserve them, and render them available for transportation and passage cars, that they are ultimately cheaply avoided, by the substition of a Tunnel, the first cost of which is well calculated to alarm those who, in a comparative estimate alone of the cost of Tunnels and inclined pl nes, overlook the continued drafts on the profits of a road to sustain the annual expenses on the latter, in the lost time in the interruption to transportation, and in the wear and tear of machinery, expense of Engineers, &c. Whatever may be the seemingly opposing obstacles to the construction of a road in the above description, they are comparatively much dimished by the fact that it embraces the whole mountainous section of the railway projected from the Carolinas to the Ohio, and that on a route of nearly 700 miles, with the exception of the passage of the Blue ridge, the great obstructions to be encountered are limited to the short distance of about 20 miles, or to the broken region between the Clinch and Cumberland mountains. This examination, therefore, in confirming the fact of the practicability of a Railroad, over seemingly the ruggedest portion of the whole route designated, will go far to strengthen the opinion that on a more minute examination of the country, the obstacles here encountered may be diminished, if not entirely avoided, and a communication between the two sections of country to be connected be obtained on a line, if not the most *direct*, offering at least the *greatest facilities* of construction, and the most extended benefits contemplated, from the Railroad which has been projected;—from representations from various sources, there are 4 or 5 other depressions in the Cumberland mountains, W. of the Gap examined by me, all of which afford such facilities for crossing, as to recommend an examination of them, in the surveys now about to be undertaken in connexion with the project for a road to Cincinnati, Baptist Gap, Deep Creek Gap, a Gap near Jacksborough, and the Emory Gap. Deep Creek Gap is a brake, as represented to me, made by that Creek, and which cleaves the mountain to its very base. Its location is very favorable, being on a direct line from Knoxville to Lexington in Kentucky, and as a tributary to the Cumberland, must afford, no doubt, on its banks or by its ridge, a slope, on which a plane may be graded from the mountain to that river. Its position is further recommended, as so demonstrating on or pointing to a route towards Nashville, as to enable the Cincinnati and Charleston company to embrace hereafter, by the valley or the ridges of the Cumberland river, that important point in West Tennessee, among the branch roads contemplated in the charter. On this route from the Blue ridge to the Cumberland mountain, there is no want of materials of the most durable character, or for labor to prepare and fabricate them for use. Indeed, few countries, if any, afford within the same limits the facilities which East Tennessee offers for works of improvement. All the elements of construction in the cheapness of labor, materials, and subsistence may be numbered among her resources to as great, if not greater extent, than are to be found in any other section of the United States.—The valleys as well as the hills are shadowed with a growth of pine, cedar, chesnut, black oak, black locust, mulberry and cotton wood; sand and blue limestone, and granite abound every where, and the bowels of the mountains are more than surcharged with iron.

Labor and the means of subsistence are beyond comparison exceedingly low. Effective hands may be obtained from 8 to 10 dollars per month, 4 or 5 horse teams with a driver at $2 a day, ox team at half that amount. Corn from 18¾ to 30 cts. per bushel. Oats from 18 to 20 cents. Flour from 4 to 5 dollars per barrel. Salt at the works 37½ cts. per bushel. Pork from 2 50 to $4 per hundred, and beef from 2 to 3 cents per pound. Estimating all these advantages, cheapness of labor, materials and subsistence, in connection with the certainty of so commanding them, as to occasion no interruption to operations, which may be commenced in the grading and construction of a Railroad, and I feel confident in the expression of the opinion, that even this most rugged and mountainous portion of the contemplated road route from Charleston to Cincinnati may be accomplished at a cost per mile not exceeding what may be found necessary in the low countries of the Carolinas. Of the route through Kentucky, I cannot report from personal observation; the information however derived from intelligent travellers, from those who have been annually engaged in driving stock, &c., from Kentucky to the different markets in the Carolinas, and from various other sources, all confirm the opinion formed that the difficulties to be encountered in the grading of a railway to the Ohio, will not be insurmountable. The principal obstacles in the direct road from the Cumberland Gap to Paris, are to be encountered in crossing the high and precipitous banks of Cumberland and Kentucky rivers; and in passing the elevations of the Log mountain, near the former stream; and of the Big Hill in the vicinity of Richmond. The Log mountain, however, it is said, may be avoided by passing down the valley of Yellow Creek, which heads near the Cumberland Gap, to the Cumberland river, of which it is a tributary, and the Big Hill may be shunned by Mount Vernon and the Crab Orchard on the direct road to Lexington. A route which will not materially increase the route to Cincinnati, and which is recommended by considerations intimately connected with the most enlarged objects in view from the Railroad communication now under consideration. Lexington is not only among the oldest and most opulent cities of Kentucky, but is situated in the centre of one of the most populous and richest districts of that State.

The pride of Kentucky, the seat of science and of the arts, the point on which hitherto most of the road communications through the different sections of the State centre and the point from whence they diverge, a connection with Lexington at once opens the avenue of intercommunication with the various other parts of the country of which it is essentially the Capitol. Already is a railway under construction from Lexington via Frankfort to Louisville; and being but 18 miles distant from Paris, that Gap has alone to be filled up, to complete the connection with Cincinnati by the route now under consideration between those two points. A communication of the Charleston and Cincinnati Railroad with Lexington ensures therefore a communication, by railways, not only between Charleston and Cincinnati, but between Charleston and Louisville, a city in its commercial importance not inferior to Cincinnati; occupying in its position below the falls of the Ohio and in its relation to Kentucky, what Cincinnati above these obstructions does to the great State of Ohio. By a communication, however, with the Ohio River, both above and below its falls, other more extensive benefits will result from the improvements now under consideration both in Illinois and Indiana, by securing to the Charleston, Louisville and Cincinnati Railroad much of the trade of those two wealthy States, and of even Missouri, via a connection with Louisville, which would be lost—was the termination of that great project to be alone at Cincinnati.

COL. BRISBANE'S REPORT.

That in prosecuting a more minute examination of the Saluda Mountain and Blue ridge than that which had been made jointly with Col. Gadsden and Mr. Holmes, he obtained the following results: That the Saluda Mountain could be ascended from the east by no less than four Gaps or depressions on its summits, viz: Gap Creek, the westermost depression, and which has been formed by a Creek of the same name, discharging into the Saluda; Hodges' Gap, from a quarter to a half of a mile to the eastward of the former; Old Saluda Gap, which leaves the State Road at Pointsett's Spring; and the Gap at the State Road. That from a survey made by Col. Hodges, who kindly tendered his personal services on this occasion, it appears that the Gap which is known by his name, and sometimes by that of Hightower's, rises from its eastern base, in the short distance of a mile and a quarter, 924 feet; that the descent from thence to Bearing's Mills, on Green River, is 356 feet in about three miles and a quarter, and the ascent from that point, to Green's, on the Blue ridge, at the foot of the Butt Mouniain, in distance of 4 miles, is 80 feet. That from a survey made by the same gentleman, the Old Saluda Gap, rises in a distance of half a mile from Pointsett's Spring, on the Saluda Road, east 332 feet; that the descent from thence to Bearing's Mills, on Green River, in a distance of 2 miles is 209 feet, and the ascent from thence to Green's 4 miles, is 80 feet. From a comparison, therefore, of these surveys, Old Gap must be depressed below Hodges' 147 feet, and the difference between 209 and 356 feet; while its descent to the eastern base of the Mountain, on the Saluda Road, is by no means as abrupt. The Saluna Road Gap is estimated from observation as equal in elevation to Hodges', while the Gap Creek Gap is evidently more depressed by 80 or 100 feet than even Old Gap; and the inclination of its slope to the low country east, is more gradual, its plane being from 7 to 8 miles in a perpendicular elevation of from 8 to 900 feet. On the Blue ridge the depressions which offer facilities for surmounting that elevation were at Green's, near the foot of the Butt Mountain, descending on a plane of from 4 to 500 feet to Green River, the descent by which to the level country was not ascertained; Mills

Gap, Reedy Patch Gap, and the Hickory Nutt Gap. From an examination of these gorges in the Blue ridge, I report, the Reedy Patch Creek as the preferable pass of the Blueridge. At this point, that chain of Mountains is singularly depressed for a distance of about 9 miles: making the distinct spur of the Sugar Loaf, the White Oak and the Look Out Mountains, and suffering a depression in their stead, from the Butt Mountain south, to the Bear Wallow north, in which it is occasionally found to be not more than six or eight feet above the flat land of French Broad. The Reedy Patch Creek leaves the Blue ridge near the northern extremity of the depression alluded to, and makes its way to the waters of the Broad River, about 4 miles above the point at which that river leaves the mountains, and with the exception of two or three distinct falls of from 20 to 30 feet each, offer fair mountain sides for grading. The rock, too, in its neighborhood, with a quantity of the finest timber, promise every facility for the best construction. I would notice the possibility here of substituting water power for stationary engines; as by reference to the accompanying maps obtained from Judge Foreman, agent for the proprietors of an extensive tract of high land in this district, it will be found that several of the streams of the French Broad and Broad River rise so high in the detached cliffs of the Sugar Loaf and Look Out mountains, as to offer eservoirs even for the use of planes ascending to the very summit of the Blue ridge. Reservations of these streams have been already made with this view, and by the enterprising individual above referred to, adding that the course of the stream is direct from the summit to its junction with the Broad River. Throughout the whole distance, should the road even pass the Tyger and Enoree at their mouth, with the exception of the ascent of the Blue ridge, which may require stationary engines, I know of no necessity of going beyond the grade of 35, or 40 feet in the mile, and this only in the immediate vicinity of the larger streams. I examined all the other passes in the Blue ridge, but giving, as I did, the decided preference to the Reedy Patch Creek, I bestowed on that most of my attention.

MR. HOLMES' REPORT.

From the Paint Rock on the French Broad River, where Col. Gadsden and Mr. Holmes separated, Mr. Holmes pursued the course to Estilville, in Virginia, passing up the valley of Paint Creek, and by the Turnpike, across the lofty summit of Paint Mountain, thence down the valley of the Nolachucky, across that stream to Greenville, in Tennessee, and thence by the most direct route, and the valley of Horse Creek to Kingsport, (the Boat Yard,) on the North side of the South fork of the Holston, one mile above its confluence with the North fork. Estilville is known as the place where a convention of citizens from Kentucky, Virginia, Tennessee, North Carolina and South Carolina, was held in 1831, for the purpose of establishing a Turnpike road from the navigable waters of the Big Sandy River in Kentucky, to the end of the Linnville Mountain, in North Carolina. This being the most direct route for connecting the Eastern part of Kentucky and Tennessee, and the Western part of Virginia and North Carolina with the Atlantic, a line on the map direct from Charleston to Cincinnati, will pass at or near Estilville, in the general direction of this route, many intelligent citizens of the several interested States became well informed of the true character of the country, and a survey was made by Col. Long, of the United States Topographical Engineers, under the orders of the Government. The report which, to the Estilville Convention, has been kindly furnished, and is herewith presented.—Availing himself of the information readly furnished from these sources, confirmed from personal observation in part, as far as the limit of time would permit, Mr. Holmes presents the following views of this route: From Portsmouth, on the Ohio river, to the foot of the Cumberland Mountains near Sounding Gap, is regarded by Col. Long as an ascending plane 100 miles long, presenting an irregular broken surface, intersected by rivers and streams flowing from hills and knobs varying in elevation from 100 or 200 feet, near the river, to 800 feet near the foot of the mountains, and presenting obstacles to the construction even of a turnpike road, deemed quite as numerous and as difficult as those presented by the Alleghany Mountains. In this direction are encountered the obstacles presented by the Big Sandy, the Licking and Kentucky Rivers, with their various tributaries. In general characteristics these streams resemble each other. The valley of the Big Sandy and its principal fork, vary in width ¾ of a mile to 3 or 400 yards, subjected to annual freshets, varying in places from 50 to 60 feet, above extreme low water, and walled in by high precipitous banks, deeply indented with ravines and water courses, thus presenting innumerable obstacles to the construction of a Turnpike road, the only practicable route for which, must be sought at a distance from the water courses, and can then only be obtained by inclined planes of great elevation, varying from 2 to 5°, or from 184.2 to 460.5 feet per mile.—From the foot of Cumberland Mountain to the summit of Sounding Gap, which is decidedly the best Gap in this direction, is an elevation of 600 feet to be surmounted only by steep mountain slopes of great angle, in one place at least 5°. The Water Gaps, formed by the head waters of the Russel and Pound forks of Sandy River, lying 15 or 20 miles northeast of Sounding Gap, are deemed impracticable from their rugged, steep and winding character. The rest of the route will be best appreciated by a knowledge of the general character of the country. The Alleghany Mountains are here divided into 3 general ranges. The North comprehending the Cumberland, Powell's and Guest's Mountains, with their numerous spurs. The middle, comprehending Clinch Mountain and several ridges, such as Copper, Moccasin, Chesnut, Baffal's, are situated between the principal branches of the Tennessee, and the Southern range comprehending the Blue ridge or main Alleghany, dividing the Atlantic from western waters. The Iron Mountains, of which the Yellow Unaka, Green, Roan, Stone, Buffalo, are constituent parts or spurs, is a distinct ridge. The Black, Linnville, Grand Father Table, and most of the other noted mountains are only spurs of the Blue ridge. The South Mountain, separated from by an extensive tract of rolling country, is of moderate height. The subordinate spurs or ridges connected with these mountains lie in all directions. The elevation of these mountains and ridges above the principal stream in their immediate vicinity, may be estimated at 600 to 3000 feet, and at 1600 to 4000 feet above tide water. The natural passes of these mountains have no general coincidence with a straight line, joining the assumed extreme points. The most favorable are Sounding Gap, in the Cumberland Mountains, already spoken of. Big Moccasin Gap, in the Clinch Mountains, at which the passage is almost a dead level, quite as low as the Water Table of the vicinity. The Blue ridge is regarded as presenting on this route, the greatest difficulty. Three passes were exammed by Col. Long, McKinney's Gap, Turkey Cove Gap, and Birch Creek Gap. The last impracticableat an inclination less than 5° and for a half a mile 6° or 552.6 feet per mile. Buck Head Gap is 2000 above Catawba River. Turkey Cove Gap is 1800 feet, and Mc'Kinney's Gap 1600 feet above the Water Table, on the north side their heights are estimated at 800 feet for Buck Creek Gap, 300 feet for Turkey Cove Gap, and 130 for McKinney's Gap. Other mountain ranges and spurs in this route present numerous obstacles in the way of a road. No one acquainted with these obstacles can conceive a more difficult route, and all the testimony, as well as the opinions we have from those best informed concur in so regarding it. The most intelligent citizens of Virginia, Tennessee and North Carolina with whom Mr. Holmes conversed, expressed a decided preference for a route by the French Broad River, to a more direct one across these several ranges of mountains. Without therefore, pursuing the entire route, but judging from the evidence before him, as well as his own observations in part, Mr. Holmes has no doubt that a reconnoisance of the country, and the future surveys of it, should be directed to the waters of the Tennessee below this line.

SUMMARY.

From these reports, we have come to the decision, that the route for a Railroad via Burke County, North Carolina, the Yellow Mountain, and Estilville in Virginia, to the Big Sandy or Licking Rivers in Kentucky, is *inadmissable.*

It is greatly to be doubted if the Topography of the world affords so singular and so striking a feature as does the valley and River of the French Broad. Drawing its waters from a thousand tributaries from the topmost elevations of the Blue ridge, and intent on its purpose of conveying them to the valleys below, it forces its way through *hills, cliffs* and *mountains*, which otherwise would be inaccessible, and so equalises and graduates the elevations overcome in the distance traversed, as to present a *plane;* the inclination of which is not to be detected by the bye. But for the rapidity of the current by his side, and the noise of the falls and rapids which continually remind him of his descent, the traveller along the banks of this stream would truly imagine himself in a level valley, embosomed in mountains and overshadowed by cliffs, notwithstanding he is moving on an inclined plane falling at the rate of 80 feet to the mile, and overcoming in the distance of 100 miles an altitude of neaaly 3000 feet. At the mouth of the Nolachucky River, he first meets *hills* which oppose his progress, while he has been descending without interruption the slope of the Alleghany, and winding his unobstructed way amid the appaling elevations of the Paint Rock, and the cloud concealing summits of the Smoking mountains. This route, by the French Broad, is furthermore recommended by the fact, that it penetrates the very centre of East Tennessee, making the wealth of that interior, and hitherto inaccessible country, tributary to the stream of commerce, which the Charleston, Louisville, and Cincinnati Railroad is destined to pour on the planes of the Atlantic. Whatever may have been the impression hitherto as to the character

and condition of East Tennessee, there is, within that seemingly limited district of country, embosomed between the Alleghany and Cumberland Mountains, more concealed sources of wealth, *agricultural, mineral* and *manufacturing*, than is to be found within a similar extent in any other portion of the United States. With a climate mild and salubrious, equally exempt from the rigors of a northern, as it is from the enervating severity of a southern latitude; with a population healthful and industrious and economical, without any of those restraints which poverty and disease in other regions often inflict on its increase, with soils yielding and productive in all those nutritive grains which contribute to the comfortable subsistence of man, with mountains carpeted with the most luxuriant natural pastures; overshadowed with forests of durable timber, and their bowels rich with coal and the substantial metals; with rivers, if uninterrupted in their navigation, affording water power at every mile, capable of propelling any machinery, with their tributaries gushing from the purest crystal fountain, it is their hitherto inaccessibility which has kept those vast *resources* in a still *slumbering state*. But once cut the barriers which separate this country from the other more prosperous, but not more favored regions of the Globe. But once open a *highway*, such as is now contemplated by the Charleston, Louisville and Cincinnati Railroad, across these elevations which separate that Mountain District from all participation in the different markets in the world, and such an animation would be given to the industry of the people, and such a developement to its resources as to place it in a position competing with, if not rivalling all other countries. Under such a state of things, the day would not be far distant, when the Lowells and Pawtuckets, the Manchesters and the Birminghams, would find their most favored locations at the cascades of the French Broad, or near the rapids of the Holston, the Clinch, and the Nolachucky. The resources of the intermediate districts of Kentucky, over which the Charleston, Louisville and Cincinnati Railroad must pass to its destination, should not be undervalued in an estimate of the benefits and profits of that great work. Passing, as the line of communication will, over the Coal and Iron districts of the Cumberland Mountains, and crossing the no inconsiderable Rivers of the Cumberland and Kentucky, at navigable points, and from whence easy connections may be had with the Salt works on their tributaries; the *Mineral, Agricultural* and *Manufacturing* wealth of these regions, whether for neighborhood distribution, or in the commercial exchanges with the other States, within the links of this Railroad connection, will form no small item in the transportation on this great highway to the West.

All of which is respectfully submitted.

JAMES GADSDEN,
A. H. BRISBANE,
JAMES G. HOLMES.

To Gen'l. R. Y. HAYNE,
Chairman Committee, &c., &c.

A MAGNIFICENT EDIFICE.—There are 3000 workmen at St. Petersburgh, engaged upon the new cathedral of St. Isaac. The outside of the cupola is to have 24 columns of granite; the portica is 100 feet in length, and supported by 41 columns, with bronze capitals and vases.

From the Georgia Messenger.

KNOXVILLE CONVENTION.

The following proceedings of the Railroad Convention, we copy from the Knoxville Register, which comprises all the acts and doings of that body of general interest.

The representation in that Convention, we venture to affirm, comprised a greater assemblage of talented men than has ever met in the United States for any similar object, and we feel assured will be marked as a new era in the wealth and greatness of the Southern and Western States.

The number of delegates from each State, were as follows:

Ohio,	5	South Carolina,	82
Indiana,	4	Georgia,	55
Kentucky,	60	Alabama,	9
Virginia,	10	Tennessee,	125
North Carolina,	30		

On motion of Mr. Wickliffe,

Robert Y. Hayne was unanimously chosen President, and being conducted to the chair he addressed the Convention.

Pryor Lea was appointed Secretary.

Mr. Blanding presented to the Convention a report, signed by Robert Y. Hayne, Abraham Blanding, Patric Noble, Thomas Smith, Thomas L. Jones, and Charles Edmonston, South Carolina Commissioners on the "Louisville, Cincinnati and Charleston Railroad," which was read.

Ordered, That the Committee consist of thirty-nine delegates, to be appointed by the President. This Committee afterwards increased to 45.

On motion of Mr. Swain,

Resolved, That the same Committee be instructed to enquire and report to the Convention whether a practicable route for said road has been found, and the probable cost thereof, and that so much of the report o. the Commissioners as relates to these subjects, be also referred to them.

Resolved, That the same committee be further instructed to enquire and report to the Convention on the advantages to arise from the construction of the said road, and especially the extent and value of the commercial intercourse it would establish among the States interested therein, and that so much of the report as relates to that subject be also referred to them.

On motion of Mr. Wickliffe,

Resolved, That the same Committee be further instructed to enquire and report, upon the measures necessary to be adopted to insure the construction of the proposed road. at the earliest possible period, should the same be found to be practicable at a reasonable cost, and that so much of the report as relates to this subject be also referred to said Committee.

TUESDAY, JULY 5.

Mr. Blanding presented the charters of the Louisville, Cincinnati, and Charleston Railroad Company, which charters were referred to the committee.

Mr. Drake presented a report of Jacob Pearson on the subject of the Hiwasse Railroad, and moved its reference, together with the charter for that road, to the committee—and it was ordered accordingly.

Mr. Alston presented a report from the commissioners appointed at Monticello, South Carolina, concerning the Broad River route: which report was referred to the committee.

On motion of Mr. Beaty,

Resolved, That the committee to whom were referred the present charters for the Railroad, be and they are hereby instructed to inquire into the expediency and propriety of amending the said charters so as to make a branch from the main stem of said road at, or near Knoxville, to run thence the most direct and practicable route to Louisville, Kentucky, provided Cumberland Gap is made a point in said road. And further, that said committee enquire into the expediency of getting competent engineers to examine and report upon said route, to the next session of the Kentucky Legislature, embracing in their report, the advantages that would result to the stockholders, and the community at large, as well as to the agricultural, commercial, and manufacturing interests in the region of country through which the branch would run.

Mr. Starke presented a report from the committee appointed at Winnsborough, on the trade, &c., of Fairfield District, South Carolina; which report was referred to the committee.

Mr. Thomas presented a report of the manufactures and commerce of Cincinnati; which was referred to the committee.

On motion of Mr. Field,

Resolved, That the committee be instructed to enquire into the expediency of connecting the Louisville Branch of the Charleston and Cincinnati Railroad with the Ohio and Indianapolis Railroad, and that the charter of said company, be referred to their consideration.

Mr. Coffey presented a report from the exploring party of the McMinn county delegation, on the route indicated by the charter of the Hiwasse Railroad; which report was referred to the committee.

Mr. Parkman, on behalf of the Georgia delegation, presented a report on the commercial advantages presented by Georgia to the west, in connection with a contemplated Railroad communication; which report was referred to the committee.

On motion of Mr. Sharp,

Resolved, That the committee take into consideration the expediency of procuring a reconnoisance of the route through Cumberland and Moccasin Gaps in Virginia, and of an application to the Legislature of that State, for a charter for a road through her territory; and report their opinion thereupon to the Convention.

WEDNESDAY, JULY 6.

Mr. Chappell, on behalf of the Georgia delegation, submitted a report; which was referred to the committee.

On motion of Mr. Cocke,

Resolved, That the committee consider and report on the expediency of giving some expression of opinion on the part of this Convention, as to the obligation on the part of the Direction of the proposed company, of having all the routes examined within the limits of the charter, before the line of Railroad shall be laid down.

Mr. Fox, in behalf of the delegates from Pulaski county, Kentucky, presented their

report which was referred to the committee. The President submitted a report of the Brigade of Engineers; which report was referred to the committee.

Mr. Blair, in behalf of the delegation from Washington, Sullivan, Carter, and Johnston counties, Tennessee, presented a statistical report on those counties; which report was referred to the committee.

On motion of Mr. Kane,

Resolved, That the committee be requested to enquire into the expediency of the examination of the route from Moccasin Gap the head waters of Sandy.

On motion of Mr. Clayton, of Ga.,

Resolved, That a committee be appointed to select for publication, from the various documents presented to the Convention, such papers as they may think necessary and proper, showing the advantages of the several routes proposed to connect the southern and western States by a *system of Railroads*.

And ordered that the committee consist of one member from every State.

The Convention adjourned until to-morrow, meridian.

THURSDAY, JULY 7.

Mr. Dunkin, in behalf of the delegation from South Carolina, presented a report on the advantages of that State in connection with the contemplated Railroad; which report was read, and referred to the committee.

On motion of Mr. Cocke,

Resolved, That the Engineers, who have been engaged in making the surveys and reports, be invited to seats within the bar of the house.

The President, according to a resolution of yesterday, announced the following committee on the subject of printing: Mr. Clayton of Ga., Mr. Williams of Tennessee, Mr. Blanding of South Carolina, Mr. Swain of North Carolina, Mr. Nicholas of Kentucky, Mr. Drake of Ohio, Mr. Field of Indiana, Mr. Johnston of Virginia, and Mr. Fearne of Alabama.

On motion of Mr. Bradley, on behalf of the Tennessee delegation, the following document was laid on the table.

Resolved, By the Tennessee delegation, That they will individually surrender their preferences for any particular route for the Louisville, Cincinnati, and Charleston Railroad, and will cordially co-operate with others in carrying the charter into operation on such route as may be designated by the Engineers under the authority of the company, when formed.

Mr. Churchwell, on behalf of the Tennessee delegation, presented a statistical report of East Tennessee; which report was referred to the committee.

Mr. Wickliffe, from the committee, presented the following preamble and resolutions.

THE REPORT OF THE COMMITTEE OF FORTY-FIVE.

The committee to whom was referred the report of the South Carolina Commissioners, and the four resolutions directing them to consider the charters, and to enquire and report on the practicability, probable cost, and commercial and other advantages of the proposed Louisville, Cincinnati, and Charleston Railroad, and the measures necessary to be adopted in relation thereto, have had these important subjects under consideration, and find that charters have been passed by the Legislatures of South Carolina, North Carolina, Tennessee, and Kentucky, for the purpose of extending a Railroad from Louisville and Cincinnati, to Charleston, through the States above mentioned. Having examined the provisions of these charters, the committee are of opinion that they should be accepted.

1. Resolved, That in the opinion of this Convention, the charters of the Louisville, Cincinnati, and Charleston Railroad should be accepted; and should alterations or amendments hereafter be found necessary, that application be made therefor to the Legislatures of the States granting the same; and this Convention hereby urges upon the said States the expediency of granting such application, should the same be made, and can entertain no doubt of the disposition, which will be felt by the Legislatures of said States, to comply with all reasonable requests, which may be made by the company, when the same shall be formed.

2. Resolved, That it is important for Georgia, and Alabama, and Virginia to unite with the Louisville, Cincinnati, and Charleston Railroad Company by branches connecting with the main trunk of the road, at points convenient for said connection in Tennessee, on terms of mutual reciprocity and perfect equality, as to the rate, accommodation and despatch in the transportation of freight and passengers.

And thereupon Mr. Blanding from the same committee, in continuation of their report, and particularly in relation to the second resolution, submitted the following resolution, accompanied by a report.

3. Resolved, That in the opinion of this Convention a practicable route for a Railroad has been found, for connecting the city of Charleston with the cities of Louisville, Cincinnati, and Maysville, and that the same may be constructed at a reasonable cost, and entirely within the means of the several States interested therein.

And thereupon Mr. Drake, from the same committee, in continuation of their report, and particularly in relation to the 3rd resolution, submitted the following, accompanied by a report.

4. Resolved, That in the opinion of this Convention, the amount of transportation and travelling on said road, will increase for an indefinite period of time, and that it will, from the completion of the road, be such as to render its estimated cost a profitable investment.

And thereupon the President from the same committee, in conclusion of their report, and particularly in relation to the fourth resolution, submitted the following resolutions, accompanied by a report.

5. Resolved, That viewing the proposed road, as one of vast importance to *the people* of the Southern and Western States, we hold them bound by every consideration of interest and duty to come forward to its support, by subscribing freely for stock, when the books shall be opened in October next; nor can we entertain a doubt, that should the road be completed at an early day by the vigorous and united efforts of the people and the States interested therein, that it will amply remunerate them for the capital invested.

6. Resolved, That we consider the Louisville, Cincinnati, and Charleston Railroad, as a work eminently entitled to the patronage and support of *the States* through which it will pass, or which may be interested therin; and as, from the national character, great cost, and magnitude of the work, it could hardly be expected that it should be carried through by private enterprise alone, we would respectfully, and do hereby most earnestly appeal to the *said States* for liberal appropriations towards carrying on the great work, which when completed, will be an enduring monument of their wisdom and patriotism.

7. Resolved, That we consider the fund which will be placed at the disposal of said States, by the division among them of the surplus revenue of the Union, as *peculiarly applicable* to this great work, which passing through several States will open a channel to the most extensive social and commercial intercourse between the Western States bordering upon the Ohio and the great Lakes, and the States on the South Atlantic and the Gulf of Mexico; thereby strengthening the bonds of our Union, and promoting the prosperity and happiness of a large and most interesting portion of our common country.

8. Resolved, That this Convention does, therefore, earnestly appeal to said States, to appropriate and set apart the said fund, or so much thereof as may be necessary for that purpose, and to cause the same to be faithfully applied to the execution of the proposed road. It is presumed that the States of Tennessee, Kentucky, Ohio, North Carolina and South Carolina, cannot receive under the distribution bill, the first year, much less than nine millions of dollars, a sum nearly sufficient to make the road; and should Georgia, Alabama, Virginia, and Indiana, become interested in it, by lateral roads, the whole amount acquired could be raised by the appropriation of the surplus of only a single year, we call upon these States, therefore, for the promotion of their own best interests, and for the sake of their posterity, not to suffer the work to fall.

9. Resolved, That, in publishing these resolutions and the proceedings of this Convention, the same be accompanied by an address, to be prepared and published in the name and behalf of this assembly, embodying and enforcing these views, and urging in the strongest manner, upon the States and the people, the duty of carrying the great work into effect.

And thereupon the entire report of the committee of forty-five was unanimously concurred with and adopted.

On motion of Mr. Drake,

Resolved, That the President be requested to prepare the address to accompany the proceedings of the Convention.

On motion of Mr. Jinkins,

Resolved, That in the opinion of this convention, a Railroad communication with the Louisville, Cincinnati, and Charleston Railroad, and the State of Georgia, and thence extending into the State of Alabama, would alike contribute to the prosperity of the States in the south, and also, those on the Ohio river, and that such efforts and Legislative provision, (provided further legislation should be found necessary) should be made as might effect upon terms of fair and just reciprocity, such connection.

On motion of Mr. John Speed Smith, the following resolution was laid on the table.

Resolved, That, as the contemplated Railroad, connecting the Ohio and the Southern Atlantic, will furnish the surest and speediest transmissions of the mail, and the most certain and expeditious means for transporting men, provisions and munitions in a period of war, it is the settled opinion of this Convention, that the government of the United States should become a large stockholder in said road.

Mr. Blanding, from the committee of forty-five, made a report, accompanied by the following resolution:

Resolved, That all communications to this Convention, pointing out the peculiar advantages of any route of Railroad between the points to be connected within the chartered limits of the company, be delivered by the Secretary of this Convention to the board of directors of the company, as soon as it shall be organized.

And thereupon said resolution was adopted.

On motion of Mr. Drake,

Resolved, That, to defray the expenses of this Convention, every member pay over to the Secretary two dollars.

The Convention adjourned until to-morrow morning, 8 o'clock.

FRIDAY, July 8, 1836.

Mr. Wickliffe submitted the following preamble and resolutions:

Whereas it has been resolved by this Convention, that it is important that a branch of the Louisville, Cincinnati, and Charleston Railroad should be extended, from some point in Tennessee, into the State of Georgia, upon reciprocal terms with those enjoyed by the States of Kentucky, Tennessee, North Carolina and South Carolina; and whereas an opportunity should be afforded to the State of Georgia and its citizens, to become participants in the construction and benefits of said road—

1. Resolved therefore, That applications should be made to the legislatures of the States of Kentucky, Tennessee, North Carolina, South Carolina and Georgia, for an amendment of the charters granted, so as to admit the State of Georgia and its citizens to become participants in the construction and benefits of said road, upon terms of perfect equality with those to be enjoyed by the States of Kentucky, Tennessee, North Carolina, and South Carolina, and their respective citizens—and that a further amendment should be provided, giving to the state of Georgia in the general direction of the company, three directors residents of that State, and a local board, as are provided for in the existing charters for the States of Kentucky, Tennessee, North Carolina, and South Carolina.

2. Resolved further, That a further amendment should be made in the existing charters of said company, providing that the branch of the road to be extended into Georgia shall commence at Knoxville, or at the nearest point thereto, if the road of the said company shall not strike Knoxville, to be constructed thence to such point in the State of Georgia as said State may elect; and, for that purpose, that the capital of said company be increased.

3. Resolved further, That the charters of the company ought to be so amended as to authorise and require the board of general direction, whenever it shall be the unanimous vote of the directors of a State to that effect, to apply the amount subscribed by a State and its citizens, in the first place to the construction of such portion of said road and its branches as shall run within the limits of said State.

4. Resolved further, That the company should not be compelled to construct the said branch from the main trunk, or road, until the State of Georgia and others shall have subscribed for that object, and paid over, as required, to the company, the amount required for the construction of the said branch, agreeably to the provisions of the charters.

On motion of Mr. Drake,

Resolved, As the opinion of this Convention, that in reference to the particular interests of the Company, and the accommodation of all the States lying between Florida and the Lakes, it is desirable, that the States, granting the charter, should so modify it, if necessary, as to allow the company to connect the northern extremeties of the road now designated or hereafter created, with the public works, and those of incorporated companies, of Indiana and Ohio, so as to secure an uninterrupted transit of goods and passengers from the Northern to the Southern frontier of the United States; and, that a similar policy should prevail on each side of said road, and in the South—*Provided*, That said continuation of the road should not be so constructed as to violate the Constitution of Kentucky and the Compact with Virginia.

On motion of Mr. J. D. Williams,

Resolved, That this Convention are of opinion that a connection of the Wetumpka and Railroad with the Louisville, Cincinnati and Charleston Railroad, will be important to South Alabama, as it would connect the Mobile Bay with the West and the North.

On motion of Mr. Clayton,

Resolved, That the committee on Printing be discharged from the duties assigned them; and, that the President, Mr. J. Williams, Mr. Blanding, Mr. Wickliffe, and Mr. Drake, be a committee to carry into effect the resolution heretofore adopted on the subject of printing.

And Resolved further, That said committee publish the document presented by Mr. Parkman, on the commercial and agricultural statistics of Georgia; and also the document presented by Mr. Chappell, exhibiting reports of the Georgia Engineers and others, as to the practicability of approaching Georgia with the Railroad by two passes; and, also, Col. Brisbane's report in relation to passing the Rabun Gap; and, also, Mr. Colcock's report—*Provided*, similar documents should be published.

On motion of Mr. King,

Resolved, That the Secretary transmit copies of the proceeding of this Convention to the Governors of the several States here represented; and the residue equally to the members of this Convention for general information.

On motion of Mr. Wickliffe,

Resolved unanimonsly, That the thanks of this Convention are hereby tendered to the South Commissioners on the Louisville, Cincinnati, and Charleston Railroad, and to the Engineers acting under their direction, for the ability, industry and zeal, with which they have discharged the duties assigned them.

On motion of Mr.

Resolved unanimously, That the thanks of this Convention are hereby tendered to the several societies that have opened their buildings for the accommodation of the Convention.

On motion of Mr. Breck,

Resolved unanimously, That the grateful acknowledgments of this Convention are due and hereby tendered to the citizens of Knoxville, for the facilities afforded the Convention in its deliberations, and for the distinguished politeness and hospitality extended to its members.

On motion of Mr. Swain,

Resolved unanimously, That the thanks of this Convention are due, and are hereby tendered to the Honorable Robert Y. Hayne, for the dignity, ability and impartiality with which he has presided over the deliberations of this body.

And thereupon the President addressed the Convention.

On motion of Mr. Earle,

Resolved unanimously, That the thanks of the Convention be tendered to Pryor Lea, for the assiduity and ability with which he has discharged the duties of Secretary to the Convention.

The Convention then adjourned *sine die*—being concluded with an address to the Throne of Grace by the Rev. Isaac Anderson, D. D.

ROBERT Y. HAYNE, President.

PRYOR LEA, Secretary.

EDITORIAL REMARKS FROM THE KNOXVILLE REGISTER.

Believing that we could not furnish our readers with a more acceptable treat, we have spread before them the entire journal of the proceedings of our late Convention. This body adjourned on Friday last. Its proceedings throughout were marked with perfect order and regularity. Adopting as the rules for its government, those of the United States Senate, and having for its presiding officer, one who has been a distinguished member of that body, our late Convention could not be otherwise than a dignified and decorous assemblage. To facilitate its transactions, most of the business was referred to a committee of thirty-nine, subsequently increased to forty-five,

composed of delegates from the nine States represented in the Convention. To the assiduity, liberality, and talent of this committee, and to the enlarged and comprehensive views of the whole Convention, may we ascribe the great and important results which were produced with so much dispatch, and in such harmony of feeling. One common sentiment seemed to pervade the Convention, that the great work *must go on*, and that no sectional or local feeling should be suffered for a moment to arrest its progress. That three hundred and eighty-one delegates, representing nine States in the Union, and the diversified interests from the Lakes to the South Atlantic, should assemble without bringing with them different opinions and conflicting views, was hardly to be expected; but the minor considerations were all lost sight of, when placed in contravention of the great and paramount objects of the convention Delegates from every quarter appeared willing to surrender every local and limited interest rather than hazard the progress of the great work. A distinguished delegate from North Carolina manfested but the general spirit of the Convention in surrendering a matter of local interest that the whole body might have "a long pull, a strong pull, and a pull altogether." This spirit of liberality extended through the various resolutions and addresses of delegates. Many interesting speeches were delivered in debating the several questions brought up for discussion. These, with a single exception, were concise, pertinent, comprehensive and sometimes eloquent. On Thursday afternoon the delegates with strangers and citizens to the number of about five hundred, partook of a sumptuous and elegant Barbacue, furnished by our citizens, in a grove near the old Methodist Church. We have never witnessed a festive entertainment, either small or great accompanied with so little disorder and confusion. After rising from the table Gen. Hayne was called on from every quarter of the company for a sentiment—he rose and in his usual animated and eloquent manner, addressed his attentive auditory for a few minutes upon the great objects of their assemblage, portrayed in glowing colors the advantages, both commercial, political and social, which were certain to result from a completion of the great work which they had then assembled to commence. He concluded his address by offering the following sentiment, and sat down amidst a universal and repeated acclamation of applause.

The proposed Union between the South and the West.—The banns have been published, and we are here to witness the ceremony—"if any man can show cause why these two shall not be united together let him now speak, or forever after hold his peace."

Doctor Drake was then called on and addressed the company by giving a lucid and comprehensive view of the consequences resulting from the completion of the contemplated work. He concluded by offering a sentiment, which we were too distant too hear, and of which we have not been able to procure a copy, but which received the universal applause of the company. Upon the call of the company some other addressed were delivered by other gentlemen of the Convention, but being compelled to absent ourselves, we could not hear them, and are, of course, incompetent to speak of their merits or the manner in which they were received.

In conclusion, we have reason to congratulate ourselves and the citizens of our whole country, that an impulse has been given by this Convention, to the prosecution of the great work, which no difficulties can resist. This great work will go on. The best talents and respectability of nine Sovereign States, stand pledged to carry it through. A body of men unequalled in talents, respectability and numbers, by any heretofore assembled in the United States, have pledged their co-operation in carrying forward this magnificent improvement, and it must succeed. We shall from time to time present our readers with the reports adopted by the Convention which are now publishing in pamphlet form.

From the Wayne County Gazette.

SODUS BAY SHIP CANAL.

The Books of subscription for the Stock of this Canal, were opened at Geneva on the sixth inst., and the whole stock, amounting to *eight hundred thousand dollars*, was subscribed on that day. The stock of this Company has gone into such hands, we learn, as to leave the construction of this canal *beyond a doubt*; and the promptness with which capitalists have stepped forward to take the stock, and pay the advance required upon subscription, is itself evidence satisfactory, of the confidence which is entertained in the excellence of the investment, and the success of the enterprise.

A new era is dawning upon the eastern section of the county of Wayne. This enterprize will render available immense advantages which have hitherto, been locked up and dormant. With a soil unsurpassed in fertility, and commercial advantages connected with Sodus Bay unrivalled on the south shore of lake Ontario, the canal will combine an immense and cheaply disposable hydraulic power, and a ready and direct communication with all the great thoroughfares of the State. Great Sodus Bay furnishes by far the best natural harbor on the sooth shore of Lake Ontario, and when the works at the mouth of the harbor shall have been completed by the general government, it will be as good a harbor as Oswego, and in many respects decidedly superior. The completion of the canal, with a trifiing additional expense, a steamboat navigation from the Bay to Ithaca, through the heart of a rich and populous interior, and meet at that place, the Railroads which connect with the great southern Railroad, and thus form a communication with Lake Erie, the Ohio and Hudson Rivers, and the great internal channels of communication of Pennsylvania.

We know of no place in the State of New-York more desirable for the location of a town, than the margin of Sodus Bay. The Bay itself is a beautiful sheet of water extending several miles inland, and the points and indenations of its shore present prospects highly picturesque and agreeably varied. Its soil is fertile, and the situation eminently salubrious, and when the capacities of nature shall have been improved by art, and embellished by wealth and trade, we may expect to behold another of the creations of enterprize and improvement, a fair town which shall take an equal place among the thriving daughters of the west.

ANOTHER RAILROAD CONVENTION.

The delegates in the Knoxville Convention, from the State of Georgia, upon mature deliberation, believe it to be of the highest importance to the South of Georgia, that a Convention should be held at Macon on the first Monday of November next, for the purpose of consulting upon the expediency and practicability of building a railroad from some point on the Tennessee river below the Suck, through Georgia, to some point on the Atlantic. It is therefore earnestly desired that every county in the State should send delegates to this Convention equal at least, to the number of their Representatives in the Legislature. And in the mean time, it is hoped and desired that all the information touching this important enterprize, be collected and communicated either to A. S. Clayton, Esq., at Athens, Ga., Charles J. Jenkins, Esq., at Augusta, Ga., M. H. McAlister, Esq., at Savannah, Washington Poe, Esq., at Macon, Henry S. Mosley, Esq., at Clayton, Jacob M. Scudder, Esq., at Coal Mountain, Forsyth county, or R. H. L. Buchanan, Esq., at New-Eachota, Cass county, who have been appointed a Committee of Correspondence for that purpose.—[Miners Recorder.]

WORTHY OF IMITATION.

LIBERALITY OF THE RAILROAD COMPANY.—At a meeting yesterday of the President and Directors of the Richmond and Fredericksburg Company, the following resolution was adopted:

The board being informed that many persons have freely released to this company all claim to damages for lands used by this company in making the railroad, and being desirous of making some suitable return therefor, doth resolve, that all persons who have given such releases shall have the privilege of transportation on the railroad for themselves, when they may desire the same, for a term of five years from this date. In case of the death within the term of five years of any person who has given such release, the board will hereafter make such provisions as may seem reasonable.

The President is directed to report to the board at its next meeting, a list of the persons who have given such releases, with a statement showing which of them have died, and who are the next of kin to those who have died.—[Richmond Compiler.]

Chamber Stove.

Parlor Stove.

Hall Stove.

REMARKS ON THE STRUCTURE AND PRINCIPLES OF OLMSTED'S STOVE, FOR BURNING ANTHRACITE COAL.

The Plate (see Frontispiece) represents three varieties of this stove, adapted respectively to parlors, to chambers or offices, and to halls or large open rooms, as stores and churches. The *Parlor* and *Chamber* stoves are designed to stand close to the fire place, being connected to the chimney by short pipes which proceed from the back of each cylinder. The *Hall* stove is intended to communicate with a distant flue, by a smoke pipe.

In the construction, the inventor (Professor Olmsted of Yale College) was guided by principles strictly philosophical. After it was observed that the volume of aeriform products, arising from the combustion of anthracite coal, is exceedingly small, when compared with that from wood and other kinds of fuel, it was perceived, that a great loss of effect must accrue from transmitting the heated current through a large open pipe. Thus in figure 1., which represents

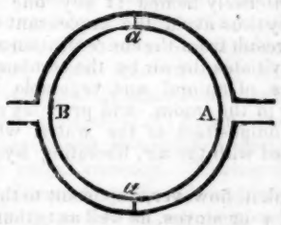
a pipe eight inches in diameter, it is obvious that the heated air, which is itself a bad conductor of heat, would part with its heat slowly except within a small distance from the surface, such as is represented in the shaded circular ring, while the large portion of the capacity of the pipe, constituting the vacant space within this ring would be nearly ineffectual. Hence, it would be only after circulating through a very long pipe, that the heat could be all absorbed and distributed to the apartment.

To remedy this difficulty, several different expedients have been adopted. Some have employed a *small* conducting pipe, or a series of small pipes, with the view of securing a greater amount of surface in proportion to the interior vacant space.* But although a comparatively small pipe will serve to convey off the heated air from an anthracite coal fire when well ignited, yet on first kindling, when the volume of gases is much greater, the draught of such a pipe is insufficient, and smoke and noxious fumes flow into the room. Such pipes also are peculiarly liable to get choked by the deposite of soot.

Others have attempted to obviate the difficulty in question, by using a *flattened* pipe, or some equivalent contrivance, where the opposite surfaces are made to approximate to each other, and the proportion of vacant space is greatly diminished. A fair specimen of this structure, is seen in the ascending cast iron pyramidal pipe of Doctor Nott's stove.

It occurred to Professor Olmsted, that the same end might be more conveniently attained by the combination of two similar figures, like two concentric cylinders. Here the parallel surfaces may be brought extremely near to each other, so as to force the heated current into close contact with the absorbing surfaces, and yet space enough be left to secure a good draught. For example, if we make the outer cylinder 14 inches in diameter, and the inner cylinder 12 inches, leaving only 1 inch distance between the two, the space occupied by the circular ring will be proportioned to the difference between the squares of the diameters, and consequently be proportioned to the difference between 144 (=12²) and 196 (=14²); that is, it will be as the number 52, and therefore proportioned to a pipe $7\frac{1}{2}$ inches in diameter.* In like manner, a seven inch cylinder within a nine inch, leaves a space equivalent to that of a pipe more than $5\frac{1}{2}$ inches diameter.

We have then, in this combination all we can desire, namely, an ample draught along with a great amount of surface, and yet a vacant space so narrow that the heated current cannot flow through it without being brought closely into contact with the absorbing surfaces. Indeed, so small is the volume of aeriform products arising from the combustion of anthracite coal when well ignited, that, by making a separate pipe for kindling, (which is closed as soon as the fire burns freely,) the two cylinders may be brought within *half an inch* of each other as is represented in figure 2, and yet, when free from soot, a good draught obtained. It has, however, been found preferable, on all accounts, to leave the distance $\frac{3}{4}$ of an inch. The employment of this principle, namely, *a greater proximity of the opposite absorbing surfaces* than has been heretofore used, constitutes the first peculiarity of Olmsted's stove.



But, secondly, it has been ascertained, by experiments in transmitting heated air through a pipe, that the absorbing effect of the pipe is increased by making the heated air descend and ascend, as in traversing a succession of elbows.* In drums somewhat resembling this *Radiator*, inasmuch as concentric cylinders have been employed, the usual practice has been to place the two cylinders so far asunder as to lose that signal advantage of *closeness of contact* between the heated current and the absorbing surface, an advantage which is gained only by a proximity of the parallel surfaces. Moreover, it has been usual to introduce the heated air in such a way as to make it ascend through the open space between the two cylinders, flowing loosely from a pipe in the bottom to one in the top of the drum. But a peculiar advantage, (which is remarkable considering the simple manner in which it is gained) is secured by employing a vertical partition,† which forces the heated air first to descend on one side, and then, flowing under the inner cylinder, to ascend on the other side, thus traversing the surfaces of the two cylinders in a manner the most favorable for the perfect absorption and distribution of the heat. But, thirdly, since the inner cylinder would thus become rapidly heated, it was necessary to introduce a current of cold air into the central space, which was easily done by letting an open pipe pass through the bottoms of both cylinders. By this means the colder air of the room, which is always nearest the floor, would flow into the vacant space, as air flows into the chimney of an argand lamp.

These three principles combined, namely, *a greater proximity of the absorbing surfaces* than had before been employed,—a *vertical partition*, causing the heated air to traverse those surfaces more effectually,—and *a current of air* flowing through the central parts of the radiator, constitute the peculiarities, and form the grounds of the claim to originality in this stove.

*The surfaces of cylinders are proportioned to their diameters, while their capacities are proportioned to the *squares of the diameters*. Thus, if we compare a six inch and a three inch pipe, their capacities are as 36 to 9; or the larger pipe has four times the capacity of the smaller, with only twice the surface.

* Let D be the diameter of the larger, and d that of the smaller cylinder. Then the corresponding circular sections will vary as D^2 to d^2; that is, putting C for the larger and c for the smaller cylinder,

$C : c :: D^2 : d^2 \therefore C - c : c :: D^2 - d^2 : d^2$;
or $C - c \propto D^2 - d^2$. Q. E. D.

* See, particularly, M. Marcus Bull's Experiments on Fuel, where the efficacy of this principle is fully exhibited.

† Seen at *a a*, in figure 2, which is a horizontal section of the radiator, near the top.

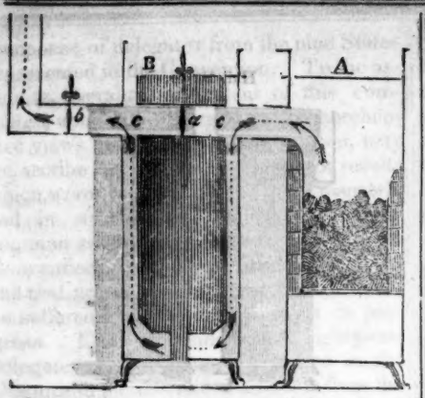


Figure 3 represents a vertical section of the "Hall Stove." The structure is composed of polished Russia sheet iron, and consists of two parts, the *furnace* A, and the *radiator* B. The furnace is lined with fire brick, and all the other parts of the entire structure which are exposed to the action of the heated gases, are protected by a wash which hardens by heat, and at once defends the iron from burning out, and prevents its being corroded by the acid fumes that are produced in the combustion of anthracite coal. For the ease of kindling, and to prevent smoke and gas, a pipe, open at both ends, is let through the miner cylinder, as represented at *c c*, forming a direct communication from the furnace to the smoke-pipe. As soon as the fire is well kindled, this pipe is closed by the damper *a*, when the current immediately takes the circuitous route indicated by the arrows. A copious radiation of heat from the whole external surfaces of the stove, with the addition of a constant current of hot air rising from the top of the radiator, diffuses warmth rapidly, and in a few minutes brings the room to the required temperature. When the fire is too intense, the damper *b*, which closes half the capacity of the pipe, is turned, and the fire continues to burn uniformly, demanding very little attention for many hours.

A singular *softness and purity of air* has been found to attend the use of this stove. This desirable quality has been secured by the following means. First, care has been taken not to suffer any part of the apparatus to become so hot as to contaminate the air of the apartment, by scorching the particles of animal or vegetable matter, that are always in greater or less amount floating in a family room. The furnace is lined with non-conductors, which do not permit the metallic surface to approach a red heat; and as soon as the heated current issues from the furnace, instead of traversing as usual, a narrow pipe, which in the parts nearest the furnace becomes excessively heated, the current on entering the radiator instantly expands over the extensive surfaces of the two cylinders, in contact with which, both within and without, the coldest air of the apartment is continually and freely circulating. Secondly, the *circulation* which is given to the air of the room by causing it to flow in at the bottom of the radiator, and, becoming rarified by heat, to flow out at the top, thus continually disturbing the equilibrium of the atmosphere of the room, has a signal effect in maintaining uniformity of temperature, and preserving the purity of the air. Finally, distributing the heat at the bottom of the apartment instead of the top, as is the case when given out from a common smoke pipe, contributes also a large share towards creating an equality of temperature above and below, securing warmth to the floor, and consequently to the feet, while the head is relieved from that oppressive sensation, which is experienced by many persons in a room whose temperature, near the ceiling, is a number of degrees higher than at the floor.

The testimony of two eminent physicians, of the cities of New-York and Brooklyn, attest the suitableness of this apparatus for the apartments even of invalids.

From JOHN NEILSON, M. D., of the city of of New-York, dated June 1st, 1836.

"Olmsted's Stove appears to me the very best contrivance to promote comfort and health, during our severely cold winters.—I have made use of two of these during the last winter,—one in our bed room, the other in the dining room,—with the most perfect satisfaction to the family. The warmth is uniform, comfortable, and not at all oppressive; and what is very desirable, furnished at a very small expense of fuel. The heat being diffused from a large surface, moderately heated, is preferable to that from a more limited surface intensely heated The material, too, of which the stove is constructed, appears to give out a soft and pure air, and its circulation through the apartments is uniform as well as comfortable. Also, the method of regulating the heat by means of valves or dampers, is a very valuable improvement."

From ALFRED C. POST, M. D., of the city of Brooklyn, dated June 3d, 1836, (addressed to the patentee.)*

"It gives me pleasure to be able to speak of your invention in terms of strong commendation. Your stove appears to me to combine in a greater degree than any other with which I am acquainted the following desirable qualities, viz; ornamental appearance, cleanliness, easy management, economy in the use of fuel, and salubrity. With regard to the first of these qualities, the beautiful material of which your stoves are constructed, and the simple and elegant form which you have given them, seem to place them in advance of any other stoves which I have seen. When they are well managed, they are very cleanly, scarcely allowing any dust or ashes to escape into the room. It is very easy to kindle the fire, either with hard wood or with charcoal; and, by a little attention to the valves and doors, the heat may be regulated to almost any extent. The quantity of fuel which they consume is very moderate, in proportion to the amount of heat given off.—The last and most important advantage is, that they favor a *pure and wholesome state of the air in the room where they are placed.* By exposing a large extent of surface, they secure a sufficient amount of heat, without being intensely heated at any one point; and they thus avoid the unpleasant effects which result from the concentration of heat, which vitiates the air by the combustion of particles of animal and vegetable matter floating in the room, and probably also by the decomposition of the water, which is combined with the air, liberating hydrogen gas.

I think it, however, important to the salubrity of your stoves, as well as to that of all others in use, that water should be evaporated upod them."†

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*Dr. POST used two stoves during the season, a large Hall, and a Parlor Stove.

†The authority of Doctor POST on this point is entitled to the greatest consideration, although, on account of the great UNIFORMITY of temperature afforded by these stoves, most who have used them, have thought an evaporating dish unnecessary, unless the heat is raised above 70 degrees.

Although the radiator of this stove may be attached to a furnace of any construction, yet the best kind of furnace, and that usually employed, is one of polished sheet iron lined with fine brick. The less the portion of heat distributed from the furnace itself, the better. The smooth surface of sheet iron, and the non-conducting power of fire brick, unite to confine the heat of the furnace. By this means, the coal being kept from cooling, burns with increased intensity; and the air of the room is preserved from that contamination which results when the furnace is heated too hot. But if the heat is not distributed from the furnace itself, the apparatus employed for this purpose must have the requisite efficacy, or an unnecessary portion of the heat will escape into the chimney. A long pipe suggests itself as the first expedient. But this is attended with various disadvantages. It is expensive, unsightly, and cumbrous; and, as usually constructed, it gives out the heat in the upper parts of the room, while it ought to be distributed as near the floor as possible. For all these evils, the Radiator of Olmsted's stove furnishes an adequate remedy. In proof of this may be offered the following certificate of *Professor Andrews* of Boston, a gentleman who has paid much attention both to the philosophical principles, and to the practical management of heat.

From PROFESSOR E. A. ANDREWS, of Boston, dated June 6, 1836.

"Having made use of Olmsted's Stove during the whole of the past season, it gives me sincere pleasure to state the result of my experience respecting it. Its advantages may be comprised, I think, under the following heads:

1. It is so constructed that, by means of its peculiar *Radiators*, all the heat not absolutely necessary to produce a draught through the funnel of the chimney, is made available in warming the room. In *economy of fuel*, therefore, no other stove is likely to surpass it.

2. As this advantage is gained without the use of a pipe, which is always an inconvenient and unsightly appendage to a stove, the two requisites of *elegance and cheapness* are happily united.

3. As the stove and its radiators occupy the lower part of the room, the cold air, which is always near the floor, soon becomes heated, and mingling with that above, produces *a uniform temperature* through the apartment.

4. Such is the peculiar construction of the whole apparatus, that no part of it ever becomes excessively heated; and *the air of the room, consequently, remains remarkably pure.*

5. *The heat can be more perfectly regulated* in this than in any other stove I have ever seen; and whether the temperature of the room requires to be raised five or fifty degrees, it may be done with equal ease and certainty, and maintained uniform for any length of time.

6. The construction and management of the fire in this stove is peculiarly easy; and if properly managed, *no dust can ever escape from it* into the room.

On the whole, then, I prefer this stove to any which I have ever used, or whose operation I have ever witnessed."

From the Journal of the Franklin Institute.

ON THE PRODUCTION AND MANUFACTURE OF SALID OR TABLE OIL IN THE UNITED STATES.

The following remarks are intended to apply to that strip of the United States, which is comprehended between the latitudes of Cape Hatteras and Boston Bay, extending westward.

Although there is no part of this extensive region in which the olive tree could be cultivated, except when protected by the green house, and therefore, the inhabitants are denied the advantages of this useful tree, it does not follow, that nature has denied them the means of procuring an excellent and pleasant substitute for olive oil, and one that could be brought into market at a moderate cost. Between them and this enjoyment, ignorance is at present a barrier, and in this case, as in many others, this is strengthened in its result, by prejudice.

In French Flanders, the farmers cultivate in large fields, and to a great extent the *White Poppy*. The seeds of this plant are collected and bruised in some way, and an oil expressed from them, which in all respects resembles olive oil, and is the source from whence is derived a large proportion of what is consumed in Paris. The poppy oil so much resembles olive oil, that strangers who visit Paris take it for that oil. These are facts as regards the consumption.

Of the state of this important branch of husbandry and manufacture, we the people of the United States know nothing. How is it cultivated, the seed collected, the oil preserved? Does the land require to be sown every year, or does it seed itself? What sort of a mill does it require? What is the product in oil, or in profit? In short, we have every thing to learn, except that, incidentally we have heard that fifty pounds of beet cake, after the sugar maker has got what he wants out of it, and ten pounds of poppy seed after the oil maker has done with it, will keep ten sheep a day and fatten them.

We know that since the article on beet sugar appeared in the Journal of the Franklin Institute, requesting those who knew any thing of the subject to favour the editor of the Journal or the public with information, a well quallified agent has been sent to Europe to acquaint himself with the whole agricultural and manufacturing business that produces sugar.

On the present occasion, we invite the patrons of our country's industry and resources, to communicate for publication, what they know on the above interesting branch of French husbandry, &c. And we therefore request the wealthy and patriotic, to consider whether the case of oil does not resemble that of the sugar from the beet, and whether the best course would not be to adopt a plan similar to that which the friends of beet super have chosen.

The time will come when American parents will send their sons to Europe and to other foreign places, to learn the manufacture of beet sugar, of oil, and such other branches of the arts not possed by us, in the same manner and with better reason that they now do to have them learn medicine and surgery. J. R.

June 4, 1836.

EFFECT OF THE VELOCITY OF AIR UPON ITS USE IN SMELTING IRON.

M. Teploff, one of the Russian Mining Corps, in an article on the improvements recently introduced into the smelting of iron in Russia, makes the following statement. In the smelting furnaces of the Ural, where the quantity and velocity of the blast are properly regulated, 1.4 of pig iron is obtained by 1 of charcoal fuel, while in other furnaces they obtain but 4. and 6. by the same consumption of fuel.

The velocity of the blast being increased, the heat within is increased, without a corresponding consumption of fuel. In an experiment made by order of the government it was found that one hundred cubic feet of air, under a pressure of two inches of mercury, produced the same effect as two hundred cubic feet, under a pressure of one inch, with this difference, that, in the latter case, twice the fuel was consumed, which was required in the former case.

In one furnace which is mentioned, 22,000lbs. of iron were obtained in twenty-four hours, by 16,000lbs of charcoal. Previous to the due regulation of the draught, they consumed twice this amount of fuel for the same yield of iron.

This economy is obtained by duly proportioning to each other the size of the blaste pipe, and the pressure of the draught. The relation of these to each other, varies with the furnace.

M. Teploff asserts that the results thus obtained exceed those with the hot-air blast, but it does not appear that any comparisons have been made under his examination, and with the charcoal fuel.

To regulate the draught, it is recommended to place two mercury or water-gauges, one near the blast-pipe, the other near the governor of the blowing-machine. By varying the pressure, and the diameter of the nozzle of the blast-pipe, making the latter smaller as the former is increased, and *vice versa*, the best proportion is to be ascertained.—[Annales des Mines, vol. vii.]

THE THAMES TUNNEL.—This stupendous undertaking is proceeding slowly, but steadily towards completion: nor has any obstruction occured since the works were re-opened. The men work night and day; there are three sets of men employed, which relieve each other every eight hours. Each set consists of 112 men, and there are numerous supernumeraries, ready to supply any casual vacancy. During the eight hours of work they are allowed only a single half hour for refreshment, which is brought to them on the spot. The wages paid are high, as much as 40*s*. and 45*s*. per week, and hence the engineer is enabled to command the services of first rate bricklayers. The men are not called upon to perform task work: all that is required is, that they keep steadily at work, and that the bricks be laid in a workmanlike manner. The cement furnished is of the very best quality, only about a barrel of fine sand being used to 100 barrels of cement. The concrete thus formed hardens very rapidly, and within two hours after any new work is completed, its solidity is put to a very severe test. The overseers go round with hammers of fourteen pounds weight, with which each separate brick is struck a hard blow. If the cement yields so as to disclose the smallest fissure between the bricks, the workman is immediately called back to repair the defect, and is, besides, fined one shilling to the sick fund. If the brick shakes in its place on being struck, nothing but a special plea in excuse can save the workman from an immediate discharge. With every exertion, from its peculiar nature the work is unavoidably tedious and slow. It is considered a good piece of work when at the end of twenty-four hours the shield can be advanced nine inches. The shield contains thirty-six boxes, and the work is being simultaneously carried on in each, so that the pushing forward the shield can only take place when the work of the arch is perfected to the extent from the bases to the key-stone. It will sometimes happen that a whole day is occupied in the mere work of pushing forward the shield. The extent of archway perfected is above 620 feet, and what remains to be done is about 1,200 feet, but of this extent a large portion being beyond low water mark, and through a solid stratum of earth, can be carried forward without such extreme caution as at the present part of the work, through a loose sandy soil, and under the very centre of the bed of the stream, is indispensably necessary.—[Morning Chronicle.]

EDWARD TROUGHTON, ESQ., F.R.S., L. AND E., F.R.A.S. AND F.R.S.C.E.

The late Edward Troughton was born in a small village in Cumberland, in the year 1754, where he received merely a common education in the village school. When seventeen years of age he came to London, and apprenticed himself to his brother John, a respectable mathematical instrument maker, carrying on business at No. 136, Fleet-street; and when out of his time was taken into partnership, and ultimately succeeded to the business, and ever after continued to reside there; and it is not a little remarkable, that the same spot has been successively occupied by mathematical instrument makers of celebrity of nearly two hundred years; and here a Sutton, a Wright, a Cole, and a Troughton, labored with unwearied zeal for the advancement of science. In a very short time after Mr. Troughton's arrival in the metropolis, he began to display that great originality of genius, which in the end made all scientific men look up to him for the means of prosecuting their pursuits with the fullest effect—for be it remembered, that the sublime study of astronomy must ever be obscure without instruments of the most acurate execution, because the theorems of ma-

thematicians are useless without data to act on—and with this he supplied them; presenting to all competent persons the means of *dividing* instruments with the most perfect accuracy, and by which they have been graduated to such a degree of exactness, that error is not to be discovered in them even by high optical powers; and many of his instruments of large dimensions are placed in various observatories, and by them a catalogue of the fixed stars, and the sun, moon and planets, are now ascertained, and published in the *Nautical Almanac*. Many other skilful artists have also acted upon his improvement. The stability, accuracy, and commodious arrangement of his instruments leave nothing for the astronomer but to use them with care, as it is a fact, that the *declination* of some of the fixed stars have been ascertained by them to one third of a second. It is unnecessary to follow Mr. Troughton step by step, but a reference to a few of his great undertakings cannot be without interest. The Royal Observatory is furnished with a mural circle, a transit instrument, and a zenith sector, all of his contrivance; and the last was completed by him when in his 79th year: also, an equatorial instrument, for Trinity Colelge, Dublin; and which is now stationed at Armagh: and a meridian circle (made for Stephen Groombridge, Esq.,) now belonging to Sir James South; the whole of which are specimens not perhaps to be equalled either in beauty or figure, or perfect accuracy. He also remodelled the continental instruments so as to make the repeating circle of the Chevalier Borda, and the reflecting circle of Mayer, almost original iventions of his own. His nautical instruments, also, both as to construction and accuracy, are beyond all praise; and by them the mariner is now indeed enabled "to mark a road on the trackless ocean." Nor were his great labors wholly unrewarded; for the Royal Society, in 180-, presented him with the Copley Medal, for his elegant and valuable paper on Dividing. On the 7th of April, 1823, he received the freedom of the Clock Makers' Company; and in January, 1830, the King of Denmark presented him with a valuable gold medal, as an acknowledgment of his great and important improvements. In his latter years he devoted himself entirely to severe study and scientific pursuit; and labored not merely in abstract theory, but for the improvement and direct benefit of the civilized world. Retaining his faculties to the last, he died on the 12th of June, 1835; and, according to his request, his remains were deposited in the General Cemetry, Kensall Green; and were followed by many, and deeply regretted by all the scientific world.—[New Monthly Magazine.]

New Orleans.—Decisive measures are about being adopted to pave New Orleans with wood, on the principle adopted between Murray and Chambers streets, in this city.

From the Journal of the Franklin Institute.

EXPERIMENTS ON THE RESISTANCE OF SAND TO MOTION THROUGH TUBES, WITH ESPECIAL REFERENCE TO ITS USE IN THE BLASTING OF ROCKS, MADE AT FORT ADAMS, NEWPORT HARBOR, UNDER THE DIRECTION OF COL. TOTTEN. BY LIEUT. T. S, BROWN, OF THE CORPS OF ENGINEERS.*

TO THE COMMITTEE ON PUBLICATIONS.

Gentlemen.—The great quantity of rock excavation required at Fort Adams, Newport, R. I., created, at an early period of the operations, an earnest desire, on the part of the officers of engineers charged with the construction of that work, to devise some method of loading and securing the drill holes which would be less dangerous to the workmen than the one which had been usually employed. For this purpose resort was had to the use of clean dry sand in the manner which will be hereafter described, it being understood that that expedient had been successfully tried at other places. It was found, however, that great prejudices existed among the workmen on this subject, and that from their belief of the inefficiency of the new method, they required to be constantly watched, to prevent them from jeoparding their own safety, by returning to the old practice of filling the holes with fragments of stones and bricks, driven in with violence above the powder. It appeared to be important that the doubts of the workmen should be put at rest, and that several practical questions connected with the use of sand, in blasting, should be solved, and it was the intention of Colonel Totten, the superintending engineer, that experiments should be made for these purposes. This intention was confirmed by the appearance, in the "Journal of the Royal Institution," and in the "American Journal of Science," of brief notices, of a paper describing some interesting experiments on the flow and pressure of sand, which had been made in Europe. I was accordingly directed to institute a series of trials, having for their object, to determine the degree and nature of the resistance offered by sand when it is attempted to force it through a tube by direct pressure, and it was intended, at the same time, to investigate, more thoroughly, some of the properties of this substance which were developed in the European experiments just mentioned.

The experiments made in consequence of these instructions were prosecuted at distant intervals of leisure during the year 1829 and 1830, but they were interrupted before all had been accomplished, which had been originally designed; nevertheless, the results obtained were interesting, and it is thought that a brief account of them may be acceptable to the readers of your Journal.

Having, subsequently to making the experiments, procured, through the kindness of my friend, Professor A. D. Bache, a copy, in French, of the original paper above referred to, which has been several times re-published in Europe, I have translated it at length, from the "Annales de Chimie et de Physique," vol. XL, page 159, and prefix the tranrlation to the summary of my own investigations.

*We are compelled to divide this interesting paper. The first part, consisting mainly of a translation of the essay of M. H. Barnard, is now given, and the experiments which form the more important part of the paper, will follow in the next number.—[Com. Pub.

TRANSLATION.

Letter of M. Huber Burnand, to Professor Prevost, on the flow and pressure of sand.

[M. Huber Burnand, two years since, presented to the Society of Physics and Natural History of Geneva, an anemometer, in which the force and duration of the wind, were measured by the quantity of sand which escaped from a variable opening, proportioned in size to the force which it was proposed to measure. On this subject, M. Prevost proposed the following question. Does not the sand in its flow, correspond in a certain degree with a liquid, and is not its discharge in consequence, more rapid, as the head in the vessel which contains it is greater? He indicated at the same time, the further researches which might be made as to the mode of action of the sand, in regard to the pressure which it exerts. Such is the origin and motive of the experiments submitted by M. Burnand to M. Prevost in this letter, which has been kindly communicated to us for publication.]

By preliminary trials, I ascertained that the two following precautions are necessary to obtain a tolerably regular flow of sand. First, it is indispensable that the sand should be sifted with the greatest care, but that it should not be as fine as flour.—The sand used by founders would be too fine for this purpose; its fall would be irregular and would be frequently interrupted without any assignable cause. If, instead of this, we take the sand used in making tiles, and carefully sift it through a cotton gauze, the holes of which are produced by a web, which presents thirty-eight threads by forty-five in the space of one square inch, we shall find it flow with the greatest facility. The second condition necessary to the uninterrupted flow of the sand, is that the opening should have a diameter of at least $\frac{1}{12}$ of an inch.

These first questions settled, I could proceed to the researches which I had in view. For this purpose, I had made two wooden boxes, one thirty one inches high, with a bottom twelve inches square, and another forty-seven inches high, with a bottom only four inches square. They were open at the top, and provided at the bottom with four small boards, sliding in grooves disposed in the form of a cross, so as to permit the aperture to be widened or lengthened at pleasure.—The slides were made thin, so that the flow should not be affected by the thickness of the wood, a circumstance the inconveniences of which, I had already discovered. These two boxes were raised on four legs, for the convenience of experimenting, and I procured an excellent stop watch to ensure accuracy in the results. The volumes were measured in a graduated glass tube, and I had also obtained a very sensible balance, with very exact metrical decimal weights.—I must add that all my trials were repeated several times, and that I had acquired by long practice, such skill in these experiments, that an error of a quarter of a second in time, would have been detected in the results.

In the most delicate experiments, I introduced metallic slides graduated to $\frac{1}{100}$ths of inch, instead of the wooden ones: they

were however, still by no means as exact as was desirable.

I shall divide my researches into two parts; those which have for their special object the flowing of sand, and those which refer more particularly to its pressure, as serving to explain the phenomena ascertained in relation to the first subject.

I. THE FLOW OF SAND.

1. The quantity of sand which flowed in a given time from a given opening, was absolutely the same, both by volume and weight, whatever the height of the sand in the box at the commencement of the experiment. There were nevertheless, occasional variations, more or less, of two or three grammes.* They were caused, most frequently, by the difficulty of introducing and withdrawing, at the proper moment, the vessel which was used to receive the sand.—The errors compensated for each other, and disappeared when quantities as great as from four to five hundred grammes were employed. Three minutes were ordinarily employed in an experiment. The quantities obtained during the consecutive ninety seconds, were weighed, and when the weights were equal we called them accurate.

The weights were placed together, and compared afterwards with others obtained in the same manner, with columns of sand of ten times the height. The results were always perfectly alike.

2. The quantity of sand flowing through a hole from $\frac{1}{8}$th to $\frac{1}{12}$th of an inch wide, was always in direct proportion to the length of the opening, a fact which is susceptible of very useful applications in several Philosophical instruments. But the least variation in the breadth of the opening, caused in the quantity of sand flowing out, an increase, which exceeded the simple ratio of the surfaces of the orifice, as far, at least, as I could judge with the imperfect means which were at my disposal.

3. The sand escaping through openings in the side of the box, flowed with the same velocity whatever the height of the column was. But if the holes were placed horizontally, and had not a vertical dimension about equal to the thickness of the board, not a single grain of sand fell from them, whatever its height in the box.

4. Sand poured into one branch of a tube bent twice at right angles, does not rise in the opposite branch as a liquid does; it only extends a very small distance from the elbow into the horizontal part.

6. Whatever may be the pressure to which sand contained in a box is subjected, it does not influence in any manner, the quantity which flows out through a given opening situated at the bottom of the box or in the sides. The experiment was made successively with masses of iron weighing from twenty-six to fifty-five pounds.

6. A graduated rod inserted perpendicularly in the top of the column of sand, and precisely in the direction of an opening below, descend in and with the sand without inclining in any direction, and with a motion nearly as uniform as that of a clock.—A rod fifteen inches long, was made at pleasure to descend $\frac{4}{10}$ths of an inch per minute or per second. An overshot wheel placed in the interior of the box, and provided with an index outside, also moved with astonishing regularity, but very slowly. If the rod, instead of being placed in the axis of motion, was placed nearer the sides of the box, it inclined with great uniformity, but at the same time descended and advanced towards the centre with a very slow motion. The velocity of this rod depends, then, principally on its position in the sand, and next on the size of the orifice. The velocity is probably also proportional to the ratio which exists between the surface of the orifice and the horizontal section of the box, since it depends upon the quantity which flows out during each instant, compared with the whole quantity.

With more care and several modifications of the apparatus, it would probably be possible to produce more regularity than I have attained, in the progress of moveable bodies, carried along by the friction of the sand.

I will remark in passing, that there probably does not exist any other natural force on the earth, which produces of itself a perfectly uniform movement, and which would not be altered by gravitation, by friction, or by the resistance of the air. We see that the height of the column has no influence on the velocity of motion of the sand, neither increasing nor diminishing it. As to friction, far from being an obstacle, it is itself the direct cause of the regularity and uniformity of the movement, as will be shown in the sequel of my experiments; and the resistance of the air in the interior of a column of sand in motion, must be very small indeed, since none of the grains fall freely. The hour glass, a time piece, which preceded all others, was thus founded on a much more philosophical basis than has been supposed, and I venture to flatter myself that my researches may be of some use to it, in its application to the arts and to science.

7. After having studied sand in motion, I examined its mode of action when distributed in heaps upon a plane.

For this purpose I began by placing isolated grains of sand on a moveable plane, susceptible of being inclined at will; they hardly rolled until the plane was inclined at least, under an angle of thirty degrees, and some remained at an inclination of forty degrees, but beyond this none remained at rest. Sand never assumes a level of itself; the angle, or the angles under which it usually presents itself, after a part of its mass has crumbled, are almost always between thirty and thirty-three degrees; it rarely maintains itself at thirty-five degrees.

In a well sifted heap, the inferior layers, themselves inclined at thirty degrees with the horizon, serve naturally as supports to the superior ones: but the greater part of the weight of these latter, is supported by the portion of the horizontal plane against which they terminate or abut. If we take away this portion of the horizontal plane or bottom, these outer layers immediately roll off, leaving those on which they rested, undisturbed and inclined under an angle of from thirty to thirty-three degrees. This explains why sand does not flow out of a horizontal opening. if the thickness of the body, through which the opening is pierced, is equal to or greater than the height, or vertical dimension of the orifice. In this case the superior layers find points of support on the sides of the containing vessel, and an absolute obstacle in the inferior layers.

Is this property connected with the form of the grains of which the sand is composed? If they had more regularity we might conjecture so, but upon looking at them through a microscope, we see such a variety of figures and dimensions that it is impossible to admit this idea. The greater part of the grains are crystalline laminæ, white, flattened and variously terminated; other particles are grey, yellow, brown, &c. with such different forms that they cannot be arranged into distinct classes.

In order to decide whether the form was of any importance in the arrangement of the parts, I tried other substances besides sand, and found that peas or small shot, although with a little more difficulty in forming them into slopes, took nearly the same angle, and followed in all respects the same laws.

II. PRESSURE OF SAND AND OTHER SUBSTANCES COMPOSED OF GRAINS.

1. An egg having been placed at the bottom of a box and covered with several inches of sand was loaded with a mass of iron weighing fifty-five pounds. The result was precisely what I had anticipated; the egg remained unbroken under the great weight which was placed above it.

I repeated this experiment, putting the sand in motion by means of an orifice at the bottom of the box. The result was the same, whether the egg was placed at the bottom or in the middle of the mass of sand.

These trials proved that the pressure excited by the mass of iron was deflected laterally by the interposition of the sand.—They proved also, that a body placed in a mass of sand, is protected by it as it would be by a liquid, although the sand has a different kind of action from the liquid, on the sides of the vessel containing it.

These conclusions being somewhat paradoxical, I resolved to have recourse to more decisive proof.

2. I took a tube of glass open at both ends, and inserted it, vertically into a small horizontal tube of wood near one end, the other end of this horizontal tube being exactly fitted into a vertical cylindrical box, $\frac{4}{10}$ths of an inch in diameter and eight inches in height.

I filled this box with mercury, as if it had been the cistern of a barometer; the mercury naturally assumed its level in the vertical tube of glass. Its height in this tube was marked. I then adapted to the box, or cylindrical cistern, a large tin tube twenty-seven inches long, and one inch and one-third in diameter. I filled this large tube with sand, taking care to pour it in very slowly, so as not to agitate the mercury.

Here was a true barometer for measuring the weight of the sand; there was an equal pressure of air on each side, so that apparently nothing prevented the equilibrium between the sand and the mercury. Although I had in part expected the result, I was surprised to see that the sand had added nothing to the weight of the mercury; the liquid kept its level to within $\frac{1}{12}$th of an inch, a difference which was produced by an accidental shaking of the apparatus during the experiment; for having changed the place of the apparatus, the mercury resumed its level as before the experiment, and preserved it as long as I maintained this state of things.*

I afterwards took the sand from above the mercury; it had not penetrated into the liquid. I substituted in its place dried peas; the large tube was completely filled with them, their weight being more than three pounds. I added an iron weight of upwards of two pounds, and lastly a pressure of the hand as great as I durst apply without endangering the apparatus. The mercury kept its level in the glass tube; not rising $\frac{1}{24}$th part of an inch. The apparatus remained several days on trial without any other result. Thus the mercury had not been acted on by the weight of the sand, nor by that of the peas.

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*A GRAMME is about 15½ grains.

* The experiment would have been more simply made with a tube bent like a syphon with parallel branches; but M. Bernard had none at his disposal.

This absence of pressure on the bottom of a vessel was still better proved by the following experiments.

3. I took the same tube of tin and suspended it from a very sensible balance; I counterbalanced it exactly, and arranged it so that it reached nearly to the floor. I placed on the floor itself, a small solid cylinder of wood, about two inches high, and a little less in diameter than the large tube, so that the tube inclosed the cylinder, and could play freely in a vertical direction. As the tube was perfectly equipoised, and suspended to the arm of the balance vertically above the small solid cylinder, it moved upwards and downwards along this latter without any sensible friction.

I next weighed out a quantity of dried peas and introduced them into the large tin tube. It lost its mobility instantly, as if it had become more heavy notwithstanding that it had no bottom, and the peas had a solid support on the top of the cylinder of wood.

I afterwards put into the opposite dish of the balance a certain number of grammes successively, until the dish descended, when the tube separated from the cylinder, allowing the escape of the peas which it had contained.

The weight required to raise the tube from the top of the cylinder was within a very few grammes, equal to the weight of dried peas which I had poured into the tube; the difference was not more than twenty grammes, whilst the weight of the peas was more than three and a quarter pounds.—The tube, therefore, appeared to be loaded with all the weight of the peas to which it gave its support.

The experiment repeated with different quantities and with additional weights always succeeded, and often within eight or ten grammes.

But it might be still objected that the lower cylinder had in some way supported the weight of the column. I therefore made the inverse experiment.

4 and 5. In this experiment I fastened the tube by two cords to two supports laterally, and suspended the small cylinder from the dish of the balance, in such a way that being equipoised before hand, it was introduced freely half an inch into the tin tube, and by the least additional weight it fell and permitted the escape of its load.

I then poured about three and a quarter pounds of peas into the tube, and finding that the wooden cylinder, which was perfectly free, did not fall, I added a weight of two and a quarter pounds and other weights, without even moving it. It might still be objected, however, that the small cylinder adhered to the sides of the tin tube. To answer this objection, and to render this experiment more striking, I removed the cylinder, and made use of a simple disk of wood of greater diameter than the tube, and supported against its bottom by placing in the balance just weight enough to keep the two in contact. This weight was commonly from ten to twelve grammes.

I then filled the large tube with from three to four pounds of sand, and placed additional weights upon the top of the column nevertheless the disk retained by the small counterpoise of ten or twelve grammes, did not move. If this same weight of a few grammes had been laid on that part of the disk which projected beyond the tube, it would without doubt have caused it to fall. for it alone retained the disk in its place A slight touch of the finger, caused the sand to pour from the lower end of the tube, and fall into a basin placed below to receive it. The disk was therefore instrumental in retaining the sand, but did not sustain the weight of it, which was all transferred to the sides of the large tin tube. Ten grammes would have caused the disk to separate from the tube, and since it remained adhering to it, the disk was not loaded with the mass of the sand.

6. To remove all kind of doubt, I gave up the use of the balance, and placing a tub of water near the large fixed tube, floated the disk of wood on the water with the smooth side upwards; I then brought the end of the tube down upon the disk, and poured water into the tub. The disk was pressed by the weight of the water against the end of the tube. I next filled the tube with dried peas but the disk did not move. It, however, was essential in retaining the peas, which without it would have fallen through the tube, but the peas did not press upon it, since a very small force would have sufficed to make them fall from the tube and thus derange the whole apparatus.

7. Leaving every thing in the same condition, I poured water into the large tube; it was kept there with the peas, for a considerable time, until an unforeseen motion produced by the compressed air, which was disengaged from the bottom of the tube, caused the machine to incline. The peas then escaped into the tub, and the water flowed out at the same time. The same trial was made with sand; a considerable quantity of water was poured on the sand, fully impreguating it, and during a very long time it was supported without flowing out.

In another trial made a little differently, the sand took such a consistence with the water, that it caused much trouble to get them out of the tube, which therefore entirely supported the weight of the sand and of the water, together with the force necessary to expel them.

8. We can make these experiments by simply causing the large tube to rest on a small conical heap of sand, whilst it is still suspended from the disk of the balance.—The sand does not escape when the weight put into the other disk is nearly equivalent to the weight of the tube and its contents.

The same trials succeeded with grain: I have repeated them with shot with equal success, although this has a very great weight. They may also be made with a simple roll of paper tied with two small strings; they are then much more striking as the weight acquired by the paper tube contrasts better with its original lightness.

9. I have repeated these experiments with a tin tube widened at the bottom and much larger than the great tube; the result was the same, although there can be no doubt that there is a limit beyond which the sand would receive no further support from the sides of the tube. This will be the case when the inclination of these sides to a horizontal plane is the same as the slope assumed by sand in a heap, that is to say about thirty degrees. I have also repeated several of these trials with a cylindrical tube four inches in diameter, with the same success.

10. From all that I had seen I presumed that it would be very difficult to force sand through a tube even by means of a direct pressure. I made the trial in the following manner. I filled the great tube with sand and laid it in a horizontal position, and with a cylinder of wood, several feet in length, and a little less in diameter than the tube endeavored to force out the sand at one end by pressing it at the other, but without success. It appeared to me that it would be easier to burst the tube than to move the sand a single inch. The tube being inclined to the horizon about twenty degrees, and the effect being thus aided by the weight of the body, the sand still could not be expelled; the same result followed in inclining the tube in the contrary direction. This explains very clearly why a blast confined with sand is as effectual as any other.

Ynerduv, 15th January, 1829.

P. S. If in the experiment in section 2, under the head of the pressure of sand, we pour water into the tube which contains the peas, the mercury will rise in the glass tube one-fourteenth of the height of the water; a proportion which corresponds with that of the specific gravities of those liquids.—The water acts as usual, but the peas exert no pressure.

2nd. There is another way of making the experiment with the tube which is within the reach of every body. Procure a tin tube an inch in diameter and as long as is desired, open at both ends. Take a sheet of fine paper and apply it against the end of the tube pressing up the edges with the hand so as to make it take its form; then moisten the edges of the paper with water and cause them to adhere to the sides of the tube. Place the end on the table and fill the tube with sand. Raise it with care, and notwithstanding the slight adherence of the paper, the sand will be sustained while the tube is freely moved about.

3d. It would be desirable to place a vessel of sand provided with an orifice for its escape, under an air pump, in order to determine whether the velocity would be affected by its flowing in a vacuum.

Biblioth. Univ. XL. 22.

(To be Continued.)

AGRICULTURE, &c.

From the New-England Farmer.

FARMERS' WORK.

CULTURE OF TURNIPS.—If a top dressing of quick lime, soot or ashes be applied to turnips, soon after they make their appearance above ground, their growth will be forwarded, and it is said they will be secured against the fly. Some advise, and it may be well, if the time and labor can be spared to leach soot, and sprinkle the plants with the liquor. M'Mahon, in giving directions for the culture of turnips, says: "the plants should be left from seven to twelve inches apart; this must be regulated according to the strength of the land, the time of sowing, and the kind of turnips cultivated; strong ground and early sowing always producing the largest roots.

The width of the hoe should be in proportion to the medium distance to be left between the plants, and the distance should be according to their expected size.

The proper time for the first hoeing is, when the plants, as they lie spread on the ground are nearly the size of the palm of the hand. but if weeds are numerous and grow rapidly, they should be checked before the plants have attained that size, lest being drawn up thin and slender they should acquire a sickly habit.

SOILING LABORING OXEN AND HORSES.—Instead of turning oxen and horses, which you have occasion to use frequently into a large pasture, in which it is difficult to find or to take them, you may do better to *soil them*. By soiling, we mean to keep them in stables, stalls, yards, &c. and mowing and carrying to them grass and other green or dry food. You should in such case, take care that they have always water at

hand, and plenty of litter to absorb the liquid manure, unless you have reservoirs. &c. to prevent its waste. Arthur Young declared that "Lucerne is the best plant for soiling, and an acre of it will go farther than anything else." But clover or any other grass, green or dry, oats or Indian corn, cut up near the roots, cabbages, &c. &c. may often be economically disposed of in feeding cattle and horses, whose services are needed for the prosecution of the daily and hourly labors of the husbandman.

FALLEN FRUIT.—Be very careful to gather all punctured or decaying fruits, whether on your trees or on the ground, and give them to your swine. If you do not, the worms which such fruits contain, and which have been the cause of their premature decay, will make their escape into the ground, and you will find the evils, which wait on their visitations will increase on you another season.

GRAFTED TREES—Look over your fruit trees, which were grafted last spring, or budded this summer, and suffer no shoots from the stocks to remain; lest they rob your grafts of their nourishment.

WORMS IN THE HEAD OF SHEEP.—There exists in some parts, if not in all parts of the country, a species of fly, which naturalists denominate *oestrus ovis* or *sheep-bot*, of the ame genus though of a different variety with the fly which deposits eggs on the hair of horses and causes bots in those animals. This fly attacks sheep from about the middle of August to the midele of September, deposits eggs in the nostrils of the animals, and cause those *worms in the head*, which so frequently destroy them. The Mechanic's Gazette recommends as a preventive, "covering the nostrils of the sheep with a gauzy substance, through which the animal can breathe, and keeping it in its place by some adhesive substance. We doubt, however, the practicability of keeping a gauzy substance in its place by any adhesive matter.

Another precaution which sheep owners assure us has been found effectual, is to keep the noses of sheep constantly smirched with tar from about the middle of August to the latter part of September. If the sheep swallow some of the tar, so much the better, as it prevents or cures the rot and confirms their health. In order the better to effect the smearing of the sheep's noses, the following process has been recommended: Mix a little fine salt with tar, just enough to make the tar agreeable to the animal, and place the mixture under cover, where the sheep can have access to it, and they will keep their noses sufficiently smeared to prevent the insect from attacking them.

From Hovey's Gardener's Magazine, for August

GENERAL NOTICES.

METHOD OF PRESERVING PLANTS DURING A LONG VOYAGE.—The following letter was communicated to Messrs. G. C. R. and W. Fox & Co. by Capt. R. Gillies, of the ship Hibernia:—

In accordance with your wishes, I have much pleasure in describing to you the mode in which the plants brought by me from Calcutta were put up. The plants were all intended for the green-house in England, and, I presume, were of a delicate kind. Each plant was in a box, six inches square by one foot in depth, filled to the top with a kind of clay; and, no doubt, well saturated with water, previously to being put into the large outer box, which contained eight of these small ones.

The large box was constructed in the usual way; that is, a glazed roof about two feet high, the glass strong enough to resist the fall of a small rope, or other light body. It was hermetically closed with the common *Chunam* (a sort of lime, used in India as a cement for plastering houses, &c.) of the country, and was never opened during a voyage of five months. When we arrived in England the plants were all in beautiful health, and had grown to the full height of the case, the leaves pressing against the glass.

In dry weather, I always observed moisture within the glass, which was caused, no doubt, by the evaporation of the earth, and was again absorbed by the plants.

It is difficult to account for the perfect health of the plants, without the full admission of the atmosphere; but oxygen sufficient was probably admitted, either through the pores of the wood, or otherwise. It is, however, a fact, that no water was given to them during the voyage, and that they were landed in excellent order.—*Robert Gillies. Hibernia, Falmouth Harbor, October 2, 1835.* (*The Third Annual Report of the Royal Cornwall Polytechnic Society*, Falmouth, 1835. 8vo. *2s. 6d.*—Gard. Mag.)

THE HOUSE FLY.—At the Entomological Society, on Monday, a paper by Lieut. Col. Sykes was read, on excluding the house-fly. The mode adopted was a net made of different colored meshes, of about three quarters of an inch square, and which, when placed against a window, was found quite effectual in excluding the visits of these troublesome insects from the outside of the room. The same experiment was tried with meshes made of the finest black thread, one and a quarter inch square, which proved to be equally effectual. The approach of wasps was also prevented by the above mode, very few finding their way within the boundary This was accounted for by an optical illusion in the eyes of the insect, of the highly magnifying power of vision, and the small focal length.

Now that netting can be procured at the low price of *2l. 1s. 3d.* for thirty-three square yards, gardeners might try whether, by covering a hot-house with such a net, they could not exclude both birds and wasps.—They might also apply it over standard cherry trees, and over various kinds of newly sown seeds; and, lastly, they might place it before the windows of their own cottages, to exclude the common house-fly.—(Ib.)

WATER-PROOF STRANDS OF BAST, FOR TYING TREES, and WATER-PROOF BAST MATS.—In our Second Vol., p. 192, a mode of rendering ties of bast water-proof is mentioned by Dr. Van Mons; and, while recommending a trial of metallic ties, it is but fair that we should remind our readers of this very simple mode of increasing the durability of bast. To make bast ties water-proof, it is only necessary to wet them first with a solution of soap, and next with a solution of alum. A neutral compound is formed from the soap and alum, joined to the albumen of the wood of which the bast is composed, which is insoluble in water. It has often occurred to us, that, if common matting could be woven in Russia, with the weft of pack-thread, and the woof of strands of bast, mats would then throw off the rain nearly as well as canvass; and the whole might be tanned, or rendered water-proof, by Dr. Van Mons's process. Perhaps our friend at Cronstadt might be able to induce some of the Russian mat manufacturers to try this process.—(Ib.)

CHENOPODIUM QUINOA.—This plant is cultivated in the warmer parts of North America, and extensively in Chili and Peru, its leaves being eaten as spinach or sorrel, and its seeds as rice. It is also used in the preparation of a kind of beer. Dombey, on his return from Peru, endeavored to introduce the plant as a culinary vegetable into France, but without success. From a dried specimen of the plant grown in England last year, and exhibited at a meeting of the Linnæan Society, by A. B. Lambert, Esq., V. P. L. S., it appeared, in habit, very like the strong growing British *chenopodiums*, but we should think the seeds are far too small to be ever equal in value to any of our cereals; and certainly inferior to the white beet as a substitute for spinach.—(Paxton's Magazine.)

NOTICE TO CONTRACTORS.

JAMES RIVER AND KANAWHA CANAL.

PROPOSALS will be received at the Office of the James River and Kanawha Company, in the City of Richmond, from the 15th to the 23rd day of August, for the construction of all the Excavation, Embankment and Walling not now under contract, together with nearly all the Culverts and the greater portion of the Locks between Lynchburg and Maidens' Adventure.

The work now advertised embraces the twenty miles between Columbia and the head of Maidens' Adventure Pond, the eight miles between Seven Island Falls and Scottsville, and about twenty isolated sections, reserved at the former letting, between Scottsville and Lynchburg.

The quantity of masonry offered is very great—consisting of about two hundred Culverts of from three to thirty feet span; nine Aqueducts, thirty-five Locks a number of Wastes, with several farm and road Bridges.

General plans and specifications of all the work, and special plans of the most important Culverts and Aqueducts, will be found at the offices of the several Principal Assistant Engineers on the line of the Canal.

The work will be prepared for examination by the 25th July,; but mechanics, well recommended, desirous of immediate employment, can obtain contracts for the construction of a number of Culverts at private letting.

Persons offering to contract, who are unknown to the subscriber, or any of the Assistant Engineers, will be expected to accompany their proposals by the usual certificates of character and ability.

CHARLES ELLET, Jr.,
Chief Engineer of the James River and Kanawha Company.

NOTE.—The Dams, Guard-Locks, most of the Bridges, and a number of Locks and Culverts, are reserved for a future letting. Persons visiting the line for the purpose of obtaining work, would do well to call at the office of the Company in the city of Richmond, where any information which they may desire will be cheerfully communicated.

The valley of James River, between Lynchburg and Richmond, is healthy. (20—ta18) C. E. Jr.

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

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RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation J25tf

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ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

NOTICE OF THE NEW-YORK AND ERIE RAILROAD COMPANY.

THE Company hereby withdraw their Advertisement of 26th April, in consequence of their inability to prepare in time, the portions of the line proposed to be let on the 30th June, at Binghampton, and on the 11th of July at Monticello. Future notice shall be given, when proposals will be received at the above places, for the same portions of the road.

JAMES G. KING, President.
21—tf

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)
NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

H. R. DUNHAM & CO.
4—ytf

FRAME BRIDGES.

THE subscriber would respectfully inform the public, and particularly Railroad and Bridge Corporations that he will build Frame Bridges, or vend the right to others to build, on Col. Long's Patent, throughout the United States, with few exceptions. The following sub-Agents have been engaged by the undersigned who will also attend to this business, viz.

Horace Childs,	Henniker, N. H.
Alexander McArthur,	Mount Morris, N. Y.
John Mahan,	do do
Thomas H. Cushing,	Dover, N. H.
Ira Blake,	Wakefield, N. H.
Amos Whitemore, Esq.,	Hancock, N. H.
Samuel Herrick,	Springfield, Vermont.
Simeon Herrick,	do do
Capt. Isaac Damon,	Northampton, Mass.
Lyman Kingsly,	do do
Elijah Halbert,	Waterloo, N. Y.
Joseph Hebard,	Dunkirk, N. Y.
Col. Sherman Peck,	Hudson, Ohio.
Andrew E. Turnbull,	Lower Sandusky, Ohio.
William J. Turnbull,	do do
Sabried Dodge, Esq.,	(Civil Engineer,) Ohio.
Booz M. Atherton, Esq.	New-Philadelphia, Ohio.
Stephen Daniels,	Marietta, Ohio
John Rodgers,	Louisville, Kentucky.
John Tililson,	St. Francisville, Lous'a.
Capt. John Bottom,	Tonawanda, Penn
Nehemiah Osborn,	Rochester, N. Y.

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawamkeag river on the Military road, in Maine. On the National road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contocook river at Hancock, N H. Across the Connecticut river at Haverhill, N. H. Across the Contoocook river, at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Kennebec river, at Waterville, in the state of Maine.—Across the Genesse river, at Mount Morris, New-York, and several other bridges are now in progress.

The undersigned has removed to Rochester, Monroe county, New-York, where he will promptly attend to orders in this line of business to any practicableextent in the United States, Maryland excepted.

MOSES LONG.
General Agent of Col. S. H Long.
Rochester, May 22d, 1836. 19y-tf.

PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.
Troy, N. Y., July, 1831.

** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens	Ames'	superior back-strap	Shovels
150 do	do	do plain	do
150 do	do	do caststeel	Shovels & Spades
150 do	do	Gold-mining	Shovels
100 do	do	plated	Spades
50 do	do	socket	Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York.
BACKUS, AMES & CO.
No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salisbury refined Iron. 4—ytf

RAILWAY IRON, LOCOMOTIVES, &

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

									lbs.
350 tons	2½	by	½,	15 ft in length, weighing					4 $\frac{08}{100}$ per ft.
280	"	2	"	½,	"	"	"		3 $\frac{20}{100}$ "
70	"	1¾	"	½,	"	"	"		2½ "
80	"	1½	"	½,	"	"	"		1 $\frac{35}{100}$ "
90	"	1	"	½,	"	"	"		½ "

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2½, 2¾ 3, 3¼, 3½, 3¾, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

Mr. Solomon W. Roberts, a highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us.

A. & G. RALSTON.
28—tf Philadelphia, No. 4, South Front st.

OFFICE PONTCHARTRAIN, RAILROAD Co.
New Orleans, 19th May, 1836.

THE Board of Directors of this Company, will pay the sum of five hundred dollars to the inventor or projector, of a machine or plan to prevent the escape of sparks from the Chimney of Locomotive Engines, burning wood, and which shall be finally adopted for use of the Company. No further charge to be made for the right of the Company to use the same.

By order of the Board,
JNO. B. LEEFE, Secretary.
28—3m.

☞ THE NEWCASTLE MANUFACTURING COMPANY, incorporated by the State of Delaware, with a capital of 200,000 dollars, are prepared to execute in the first style and on liberal terms, at their extensive Finishing Shops and Foundries for Brass and Iron, situated in the town of Newcastle, Delaware, all orders for LOCOMOTIVE and other Steam Engines, and for CASTINGS of every description in Brass or Iron RAILROAD WORK of all kinds finished in the best manner, and at the shortest notice.

Orders to be addressed to
MR. EDWARD A. G. YOUNG,
feb 20—ytf Superintendent, Newcastle, Del

TO CANAL CONTRACTORS.

Office of the Sandy and Beaver Canal Co.,
July 25th, 1836.

Proposals will be received at the office of the Sandy and Beaver canal company, in New Lisbon, Columbiana county, Ohio, until Monday the 10th day of October next, for the construction of about 50 cut stone locks, 17 dams, (varying from 5 to 20 feet in height) one aqueduct across the Tuscarawas River, several bridges, and about 10 or 15 miles of canal.

Plans and specifications of the work may be examined at the Engineers office, New Lisbon.

Persons unknown to the Engineer must accompany their proposals with good recommendations.

B. HANNA, President.
E H. GILL, Chief Engineer. 30—to10

TO CONTRACTORS.

Sealed proposals will be received at Jackson, until the 15th day of September next, for the graduation masonry and bridging of the 3d division (50 miles) of the Mississippi Railroad.

This road is located on a pine sandy ridge, the country is healthy, and provisions can be readily obtained at all seasons of the year.

The whole line (150 miles) will be placed under contract, as the location advances next fall; and it is believed that no institution can offer greater inducements to good Contractors than this.

F. H. PETRIE, Chief Eng.
ENGINEERS OFFICE,
Natches, June 10, 1836. 28—till Sep. 5